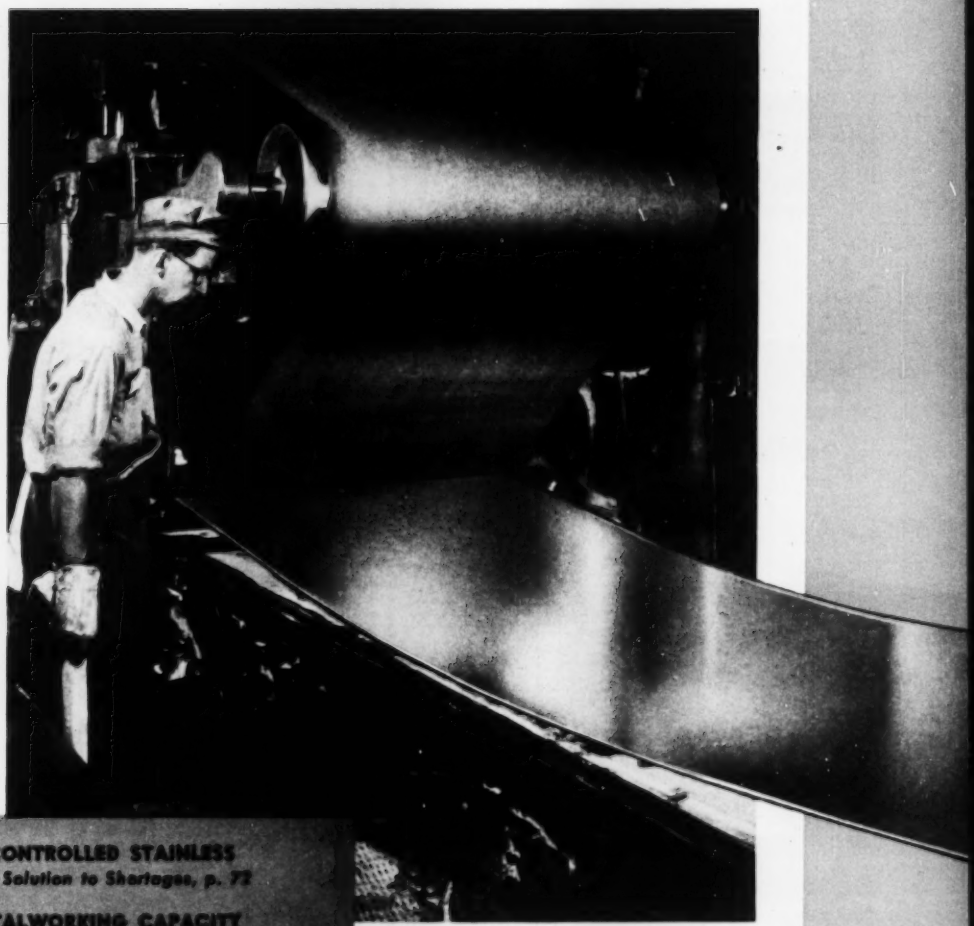
MARCH 24, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



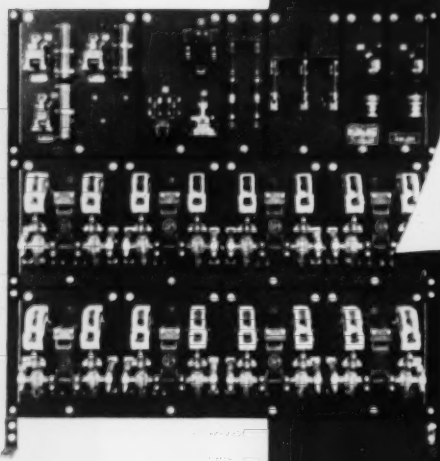
Belt-Polishing Stainless Steel

DECONTROLLED STAINLESS
—A Solution to Shortages, p. 72

METALWORKING CAPACITY
—An 8 Per Cent Rise in '52, p. 41

BORON STEELS
—Which Ones To Use and Why, p. 84

CONTENTS — PAGE 5



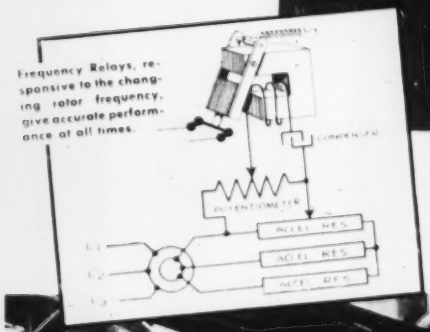
LOOK for these NAMES when buying Motor Control

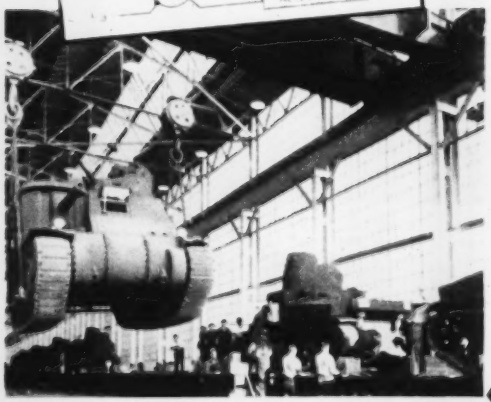
1 LINE-ARC Contactors
2 TIME-CURRENT Acceleration (D-c)
3 FREQUENCY RELAY Acceleration (A-c)
4 WRIGHT CIRCUIT Hoist Control (D-c)
5 YOUNGSTOWN Hoist Limit Stops
6 TYPE WB Brakes
7 CAM Master Switches
8 MANUAL-MAGNETIC Disconnect Switches
9 CONTRA-TORQUE Hoist Control (A-c)
10 TAB-WELD Resistors

These FUNCTIONAL NAMES Speak for Themselves

FREQUENCY RELAYS
ACCELERATING –
– PLUGGING –
– SPEED LIMITING

Improve PERFORMANCE,





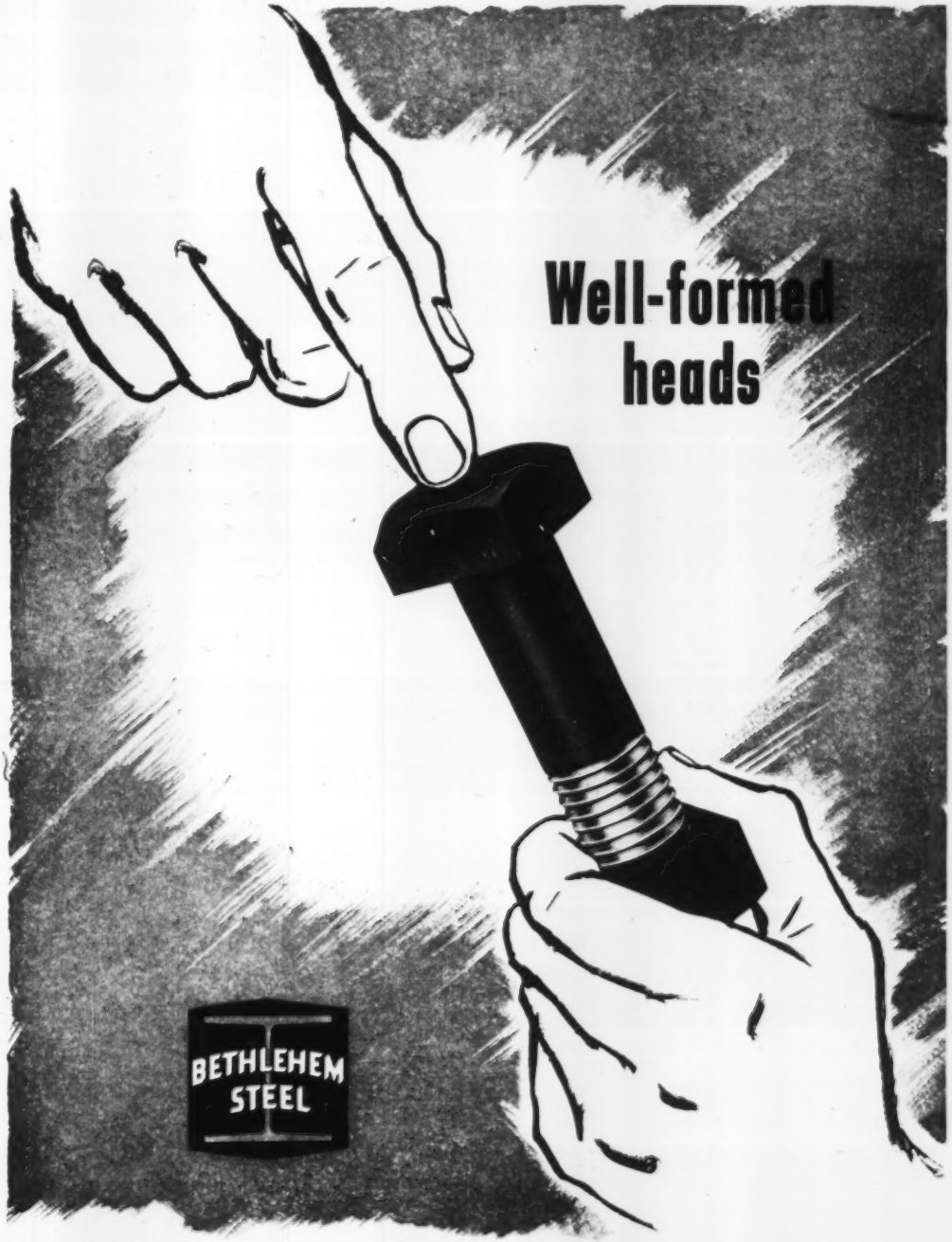
You can rely on EC&M FREQUENCY RELAYS to control a-c wound-rotor motors with precision throughout all operating speeds. *Good inching*, because weak torques for slow speeds may be used safely. *Plugging point*, accurately controlled by one FREQUENCY RELAY, with refined adjustment to close the plugging contactor at exact standstill. *Smooth acceleration* from standstill or a coasting start; heavy overhauling loads do not overshoot regenerative lowering speeds.

FREQUENCY RELAYS are inherently designed with quick pickup and clean dropout. Unlike previous standard relays connected to the rotor circuit and having a narrow range of adjustment with resultant high maintenance to keep them adjusted, EC&M FREQUENCY RELAYS operate from a resonant circuit *and are accurate*.

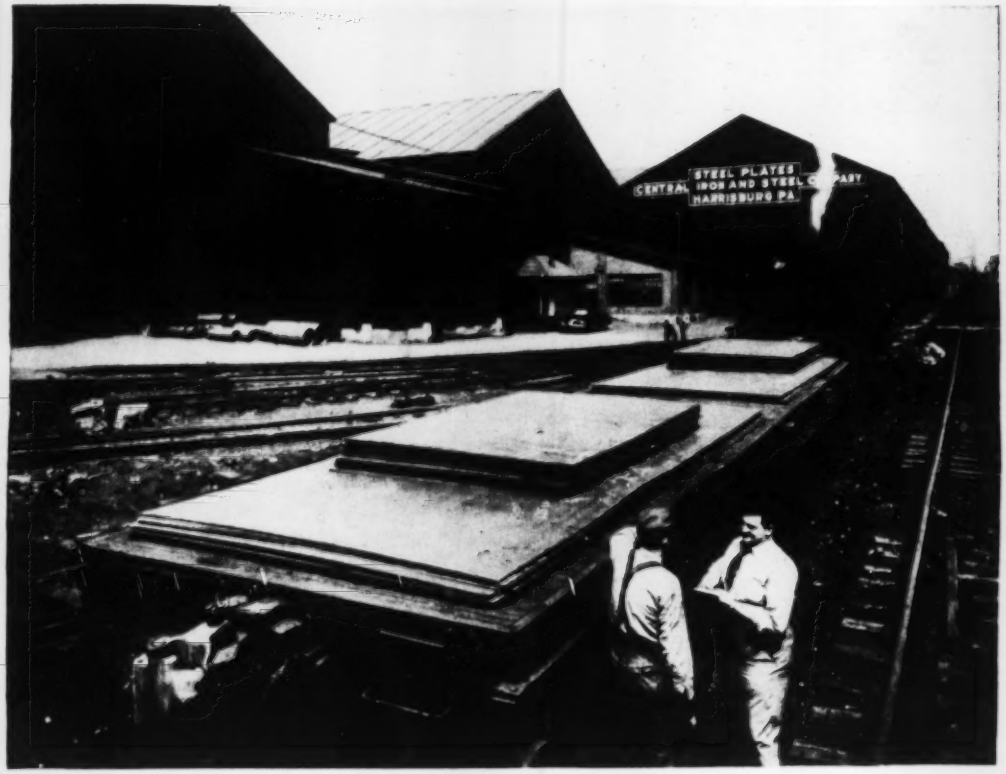
For improved performance, specify EC&M FREQUENCY RELAY Control for your next a-c wound-rotor motor installation.

ACCURATE INCHING for lowering turret-tops, etc., and other assembly operations, also when loading tanks for shipment.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO



Bethlehem supplies every type of Fastener



"Blue plate special" for industry

Here's a tempting, mouth-watering sight to every executive in a metal-working industry today.

Steel plate . . . the fine type made at Barium's Central Iron and Steel Company . . . ready for shipment.

You'll do better ordering steel plate from Central, as well as Central stampings and fabrications.

Why? Because Central is part of Barium Steel Corporation . . . a team of companies supplying industry with steel in many forms, ready to work as a self-contained unit to speed urgently-needed orders.

Think of Barium as a single source for steel, controlling quality from blast furnace to finished product, and you'll want to do business with Barium. Address your needs in steel plate to Central Iron and Steel Company at 25 Broadway, New York City.

BOLTS — Bayonne Bolt Corporation

STEEL PLATE — Central Iron and Steel Company

PIG IRON — Chester Blast Furnace

CRANES AND HOISTS — Clyde Iron Works, Inc.

SPRINGS — Cuyahoga Spring Company

BOLTS AND NUTS — Erie Bolt and Nut Company

METAL STAMPINGS — Geometric Stamping Company

DROP FORGINGS — Globe Forge, Inc.

HEAVY FLAT DIE FORGINGS — Industrial Forge and Steel, Inc.

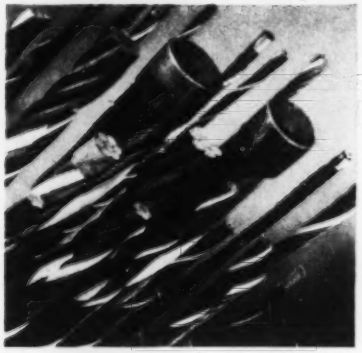
AIRCRAFT ENGINES AND PRECISION ASSEMBLIES — Jacobs Aircraft Engine Company

MARINE DIESEL AND GASOLINE ENGINES — Kermath Manufacturing Company, Kermath Limited (Canada)

STRUCTURAL SHAPES AND STEEL FABRICATIONS — Phoenix Bridge Company, Phoenix Iron and Steel Company

BARGES AND TUGS — Wiley Manufacturing Company

MACWHYTE



PREformed . . . Internally Lubricated

WIRE ROPE

for all equipment

From Macwhyte's complete line of a thousand and one sizes and types you get rope best suited to your equipment, designed, PREformed, and internally lubricated to provide long, safe service. (Catalog G-15.)

Wire Rope

SLINGS

for lifting and moving materials and equipment in production or maintenance.

There are hundreds of types and sizes of Macwhyte Flat-Braided, Round-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. (Catalog S-8.)

Wire Rope

ASSEMBLIES

for machine parts, controls, and operating devices.

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. (Catalog 5201.)

Macwhyte Company, 2912 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

Catalogs are available on request to Macwhyte Company or authorized distributor. 1016 SW

MACWHYTE COMPANY
KENOSHA, WIS.

5 Times the Service

driving air conditioning blower

CONVENTIONAL belts failed in 4 months, due to heavy overload.

G.T.M.—Goodyear Technical Man—specified Steel Cable V-Belts with load-carrying cables of airplane-type steel to handle this problem drive. Steel Cable Belts lasted 20 months 2 days—*gave five times the service.*

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS *built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor. Look for him in the yellow pages of your telephone directory.*

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

STEEL
The Weekly Magazine of Metalworking

VOL. 130 NO. 12 MARCH 24, 1952

THIS WEEK IN METALWORKING

NEWS

Behind the Scenes	6
Letters to the Editors	12
Metalworking Outlook	31
As the Editor Views the News	35
The Metalworking Contract Summary	44
Checklist on Controls	45
Windows of Washington	46
Mirrors of Motordom	53
The Business Trend	57
Men of Industry	61
Obituaries	64

PRODUCTION-ENGINEERING

Production Engineering News at a Glance 67

Die stamping plus watchcase spinning techniques produces perfect spheres for aircraft gyro dials . . .
Precision Spinning—Solves Ticklish Forming Problem 68

Nondestructive identification of each element in a specimen 3 to 5 minutes after preparation . . .
X-Ray Fluorescence Analysis—Testing at Shop Level 70

Straight chromium grades don't need CMP-4B tickets, and will be solution to many fabricating problems . . .
Decontrolled Stainless Solves Shortages 72

Electrolytic surface corrosion builds up hydrogen pressures on surface that exceeds material's tensile strength
Hydrogen Embrittles Forged Compressor Blades 76

When choosing boron alloy steel substitute, entire hardenability band need not be duplicated . . .
What Boron Steels to Use—And Why 84

Progress in Steelmaking
Blast Furnace Practice Part VII 90

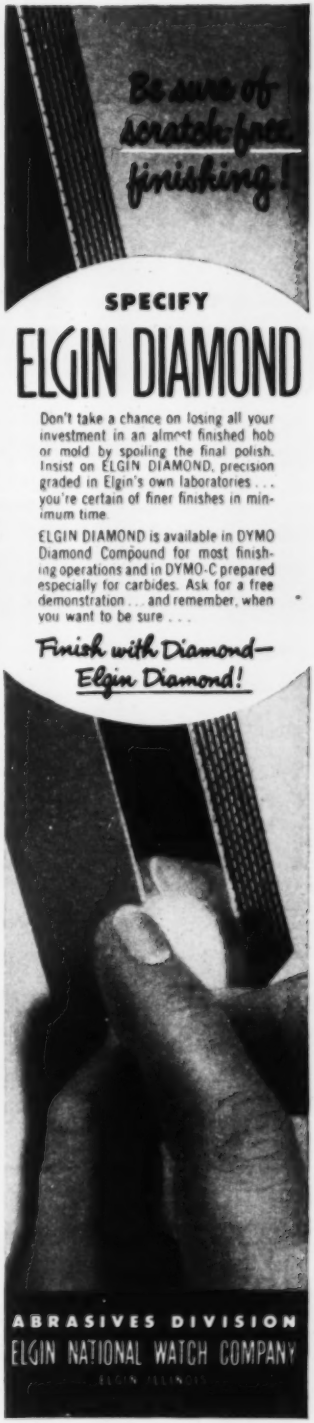
Calendar of Meetings 102
New Products and Equipment 107
Helpful Literature 121

MARKETS

The Market Outlook	125
Metal Prices and Composites	126
Nonferrous Metals	137
Metalworking Briefs	147

Editorial and Business Staff—Page 10. Advertising Index—Page 154. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

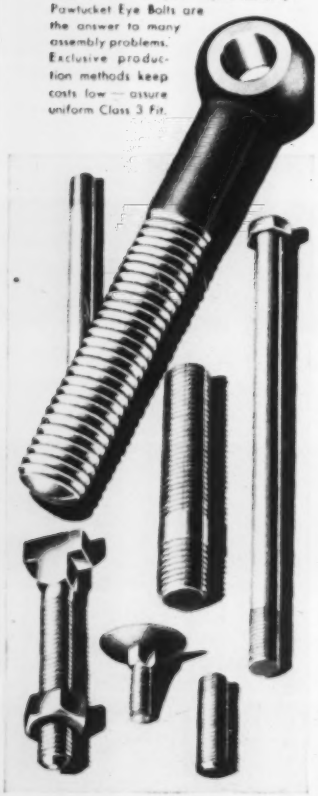
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.


Be sure of scratch-free finishing!
SPECIFY
ELGIN DIAMOND
Don't take a chance on losing all your investment in an almost finished hob or mold by spoiling the final polish. Insist on ELGIN DIAMOND, precision graded in Elgin's own laboratories . . . you're certain of finer finishes in minimum time.
ELGIN DIAMOND is available in DYMO Diamond Compound for most finishing operations and in DYMO-C prepared especially for carbides. Ask for a free demonstration . . . and remember, when you want to be sure . . .
Finish with Diamond—Elgin Diamond!
ABRASIVES DIVISION
ELGIN NATIONAL WATCH COMPANY

Looking for specialties

EYE BOLTS

Accurately made in sizes 1/4" and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low — assure uniform Class 3 Fit.



BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability

PAWTUCKET

THE BEST WAY

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T. M. REG.

Behind the Scenes...

Mr. Ross Performs

A budding television star is in our midst. STEEL's Chicago editor, Erle Ross, appeared on Austen Kiplinger's TV program, "Impact," in Chicago a while back to explain some of the implications in the steel case. During his interview with Mr. Kiplinger he told what was involved in shutting down and then re-establishing steel plant operations.

We didn't see the telecast, but our scouts did, and they report he displayed all the calm and poise of a veteran before the cameras. We expect any time now that he'll get offers to m.c. some variety show like Ed Sullivan's "Toast of the Town."

Mail Delivery

Our daily mail delivery is always an event because of the uncertainty of what we'll get. Take last Wednesday. On that day we received four bills, six answers to Puzzle Corner, 13 replies to our I.Q. quiz and this from one Hiram Mann of New York:

More taxes wax and so few wane,
Each business gain is all in vain;
But like the ever mounting debt,
Youse guys just ain't seen nothin' yet.

Verboten

Associate Editor Vance Bell was having trouble getting a big story written. Every time he got going well, someone would come in to interrupt him, even though his office door was closed.

After that had gone on for an hour and he had growled menacingly at a mail boy who came in three times, the interruptions miraculously ended. Three hours later when he had his first draft finished, he found out why. Posted on his door was a sign reading: "Measles—Keep Out."

Good Plug

We were leafing through a stack of readership reports the other day. The business department has an independent agency periodically make surveys to discover what features of this magazine are best read. We stopped at one that was particularly voluminous and were gratified to learn that the interviewee thought highly of this column.

Our gratification dropped several notches, though, when we discovered that the man being interviewed was this columnist's father, an official in a Cleveland chemical company.

We haven't decided yet whether to reveal all to the business department, or not.

High I.Q.'s

First three in with perfect scores on our industrial I.Q. quiz of Mar. 10 are Frank A. Schneider Sr. of F.A. Schneider Co., G. L. Lemich of Institutional Industries Inc. and G. Lamoureux of Peltier Handling Equipment Co. Ltd. All will get our sheepskin and B.T.S. degree poste-haste. The code to the correct answers, incidentally, is CABBAABCBBCAACB.

Puzzle Corner

First in with the correct answer to the Mar. 10 puzzle were G. J. Snyder of Ritter Co. Inc., Martha N. Stratton of Ohio State University, Marian R. Morrow of Hayes Mfg. Corp., T. G. Bean of Barber & Ross Co. and Lewis D. Rice of Timken Roller Bearing Co. There are five and seven players on the two teams.

Henry M. Hall of Pioneer Steel Ball Inc. submits this puzzle: A pole rises 100 feet from the front edge of the flat roof of a 10 foot by 10 by 10 station. Find where the pole must break and how far back of the station the top will strike the ground, so that the broken section comes to rest, with the broken end resting on the stump, the top end just reaching the ground, and the broken section, at some point, just touching the back edge of the flat roof. The pole has fallen at 90 degrees to the front edge of the roof.

Incidentally, we need more puzzles. Our little black book is running low. Send them in and if they're too tough for us to work out we try them on STEEL's statistician, George Auner. If he can't work them, we figure few people can, and we won't publish them. But all that can pass his scrutiny are fine with us and in they'll go to Puzzle Corner.

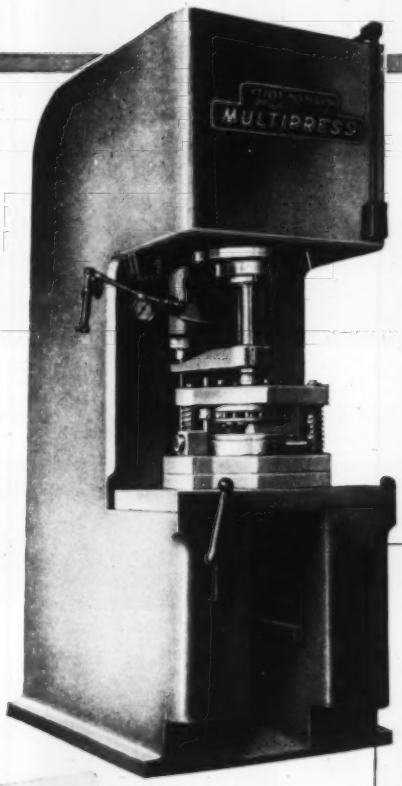
Shrdlu

(Metalworking Outlook—Page 31)

FOR FASTER PRODUCTION PLUS

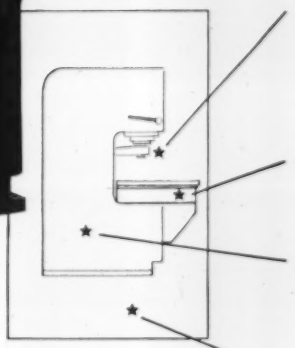
QUICK CONVERSION

standardize on MULTIPRESS®



Wide-range adjustability of action makes Multipress the quick, high-production answer to an amazing variety of manufacturing needs – ordnance jobs included. This easy adaptability pays a bonus *every time* you switch from one type of operation to another — now or later. You can convert *rapidly*, for fast production and better results, when you standardize on Multipress equipment. And *early deliveries* on most Multipress equipment give you another break on your production planning.

Here are some available Multipress features that bring you these profitable advantages:



1. FULLY ADJUSTABLE:
- Stroke Length
- Tonnage
- Ram Traverse Speed
- Pressing Speed
- Ram Dwell or Time Delay
- Ram Cycling (automatic)
  - Single or Sequence
  - Vibratory Ram Action

2. EASILY EQUIPPED WITH:
- Multipress Index Table Feed
- Multipress Dial Feed Tables
- Multipress Harmonic Stock Feed
- Hopper Feeds
- Standard Tooling Fixtures

3. WIDE RANGE OF SIZES
- 8 Frame Sizes
- 11 Tonnage Capacities
- Interchangeable Power Units, Cylinder Assemblies and Control Valves

4. PLUS:
- Good Deliveries

1 to 50-ton capacities

WRITE TODAY: for full details on the versatile Multipress and its wide range of accessory equipment.

DENISON *HydrOILics*

The DENISON Engineering Company, 1163 Dublin Road, Columbus 16, Ohio

KAISER-FRAZER is one of many automobile manufacturers using Landis Die Heads. These heads cut threads to meet rigid specifications at high production rates. Thus, they are well-suited to the mass production of automobile parts for final assembly where accurate threads are of prime importance. For further information, write for Bulletins F-80 and F-90.

Kaiser-Frazer, Willow Run Plant—⅜" F Type LANDMATIC Head cutting a ⅝" 18 pitch National Fine thread ½" long on a steering worm end. Output —100 per hour, floor-to-floor.
LANDIS
TRADE MARK REG. U.S. PAT. OFF.
LANDIS Machine COMPANY
WAYNESBORO, PENNA.

THREADING MACHINERY—THREAD CUTTING DIE HEADS—COLLAPSIBLE TAPS

FLAT SPRING STEEL

You can get it now! . . . and we believe it's the best spring steel we've ever made

OUR NEW specialty spring steel plant is in full swing. Equipped with today's most modern, precision machines, we believe we're producing flat spring steel that gives more for your money than ever before.

This new spring steel is tops in uniformity. It saves you preparation time . . . cuts down machine stoppages . . . gives you the greatest number of perfect parts from every foot and pound of steel.

With our greatly increased capacity we can make prompt deliveries on flat spring steel. And if you need high carbon round or shaped wire, ask what we can do. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

ATLANTA, 924 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 701 ST. CLAIR AVE., N. E. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 221 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

THIS HAT FITS YOU

• Fire protection is an important part of your job. Don't wait until fire proves it by closing the doors of your business . . . let a Kidde expert help you start planning fire protection *now*.

A Kidde Automatic Fire Extinguishing System may solve all your fire protection worries. Such a system is on the alert against fire 24 hours a day . . . every day. The heat from a fire hits a sensitive Kidde detector . . . causes the release of fire-smothering carbon dioxide. In seconds the fire is out.

Remember, too, that a Kidde system causes no water damage to documents, furs, electrical equipment or valuables. Write us today for further information.

Kidde

Walter Kidde & Company, Inc.
360 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

STEEL

EDITORIAL STAFF

Editor-in-Chief — E. L. SHANER
Editor — IRWIN H. SUCH
Managing Editor — WALTER J. CAMPBELL
Market Editor — WM. M. ROONEY
Engineering Editor — WALTER TOERGE
Steel Plant Editor — J. D. KNOX
Consulting Editor — ALLEN G. GRAY
Art Editor — DON S. CADOT

Associate Editors:

FRANK R. BRIGGS
VANCE HELL, JOHN S. MORGAN
EDWARD C. BIRKNER, EDWIN L. KARPICK

Assistant Editors:

SAMUEL W. BAKER, WILLIAM R. WOLFE
DOLORES K. MAILLE, M. T. BORGERHOFF
ARTHUR W. ZIMMERMAN, ROBERT E. HALL
JOHN KELSEY, ROBERT G. JAYNES
ROBERT F. HUBER, FLOYD G. LAWRENCE
L. J. SKUDERIN

Resident Editors:

Washington — E. C. KREUTZBERG
New York — B. K. PRICE, L. E. BROWNE
Pittsburgh — DAN REBEL
Detroit — H. C. TUTTLE
Chicago — E. F. ROSS
London, European Editor — VINCENT DELPORT

Editorial Correspondents:

Birmingham, R. W. Kincey; Buffalo, L. G. Feldmann; St. Louis, Mac L. Hutchens; Youngstown, George R. Reiss; Los Angeles, Norman Lynn; San Francisco, Edwin Haverty; Seattle, R. C. Hill; Dallas, C. K. Cates; Toronto, F. S. Tobin; Birmingham, Eng., J. A. Horton; Paris, France, Leon Jaudoin; Liege, Belgium, Jacques Foulon; Dusseldorf, Germany, Herbert Gross.

BUSINESS STAFF

Business Manager — J. W. ZUBER

Advertising:

Service Manager — C. H. BAILEY
Production Manager — A. V. ANDERSON
New York — E. W. KREUTZBERG, K. A. ZOLLNER, CALVIN FISHER JR.
Pittsburgh — S. H. JASPER, H. G. ROWLAND, J. C. SULLIVAN
Chicago — L. C. PELOTT, W. L. POLAND
Cleveland — D. C. KIEFER, H. G. ROWLAND, C. A. TALLINGER
Los Angeles — F. J. FULLER
Griffin, Georgia — FRED J. ALLEN

Market Research and Promotion:

Promotion Manager — E. L. FRANKE
Market Statistics — GEO. J. AUNER
Mail & List Service — BETTY HINTON

Circulation Department:

Manager — G. R. EBERSOLE
Field Representatives — H. R. DUNNE, C. A. PRICE, T. R. WARREN

Main Office:

Penton Building, Cleveland 13, Ohio
Main 1-8260

Branch Offices:

New York 17 — 60 East 42nd St., Murray Hill 2-2581
Chicago 11 — 520 North Michigan Ave., Whitehall 4-1234
Pittsburgh 19 — 2837 Koppers Bldg., Atlantic 1-3211
Detroit 2 — 6560 Cass Ave., Trinity 5-3024
Washington 4 — 1123 National Press Bldg., Executive 6849
Los Angeles 48 — 6262 Commodore Sloat Dr., Webster 1-6865
Griffin, Georgia — 331 South 12th St.
London, 2 Caxton St., Westminster, S.W. 1

Published by

THE PENTON PUBLISHING COMPANY

Chairman — E. L. SHANER
President and Treasurer — G. O. HAYS
Vice Pres., Director of Adv. — R. C. JARNKE
Vice Pres. and Secretary — F. G. STEINEBACH
Assistant Treasurer — R. W. COLEMAN

Also publisher of

FOUNDRY • MACHINE DESIGN
NEW EQUIPMENT DIGEST

CCA NBP

Member, Controlled Circulation Audit Inc., National Association of Magazine Publishers, Society of Business Magazine Editors, and National Business Publications Inc.

Built & Sold by Waterbury-Farrel
In The United States Of America And Canada Only

SCREW SLOTTING NEWS

REVOLUTIONARY, NEW WATERBURY-FARREL MACHINE SLOTS 500 TO 2000 FINISHED BLANKS PER MINUTE

Unprecedented Saw Life Per Grind

This new Waterbury-Farrel #1 High Speed Screw Head Slotting Machine uses only one hopper, one dial and one saw to pour out from 500 to 2000 burr-free, slotted blanks per minute.

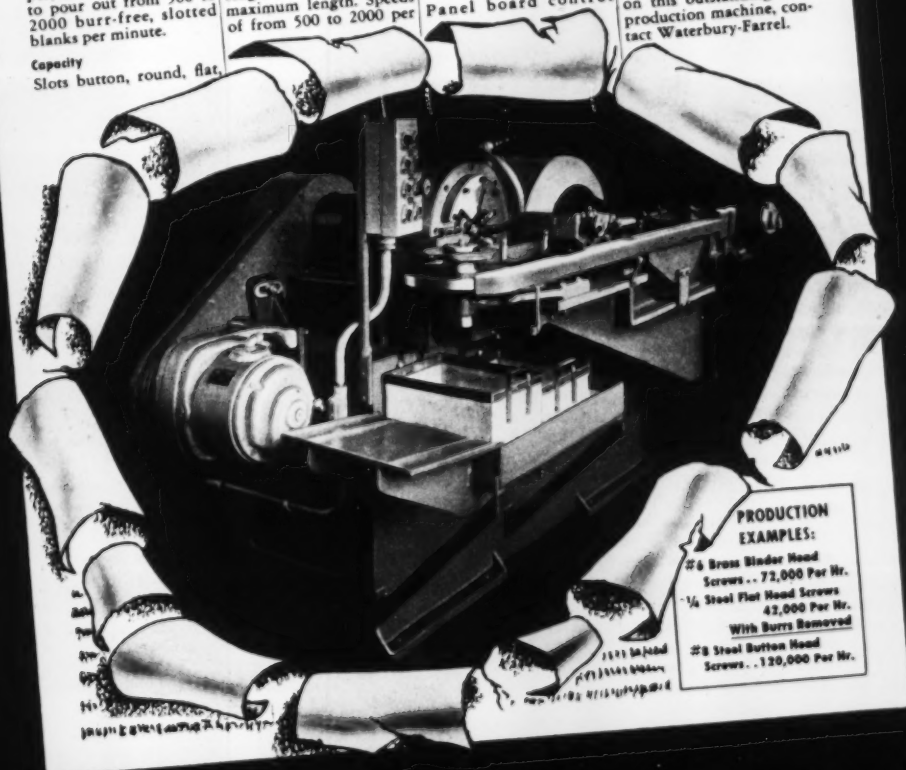
Capacity

Slots button, round, flat, flat oval, fillister, truss or binder heads (of brass or standard lower carbon machine steel), in sizes from #6 by ¼" minimum length to ¼ by ¾" overall maximum length. Speeds of from 500 to 2000 per min. depend upon shape and size of head and whether steel or brass is used.

Fully Electrically Driven . . . Lubrication Safety Interlocked

Panel board control switches are safety interlocked so that oil flow must be started first. Then the saw, dial and feed are each started in that order by separate switches.

For further information on this outstanding new production machine, contact Waterbury-Farrel.



PRODUCTION EXAMPLES:

#6 Brass Binder Head Screws . . 72,000 Per Hr.

¼ Steel Flat Head Screws 42,000 Per Hr. With Burrs Removed

#8 Steel Button Head Screws . . 120,000 Per Hr.

A FEW OF THE MANY TYPES OF METAL WORKING MACHINERY MADE BY WATERBURY-FARREL • *COLD PROCESS BOLT AND NUT MACHINERY*. Headers all types • Re-headers • Trimmers • Thread Rolling Machines • Slotters Nut Tappers, etc. *POWER PRESSES*. Crank, Cam and Toggle, also Rack and Pinion Presses • Multiple Plunger Presses • Hydraulic Presses, etc. *MILL MACHINERY*. Rolling Mills • Wire Flattening Mills • Chain Draw Benches • Slitters and various accessory mill machinery. *WIRE MILL EQUIPMENT*. Continuous Fine Wire Drawing Machines. Upright Cone and Tandem • Bull Blocks • Strand-up Machines • Spoolers, etc.

FOUNDED WATERBURY FARREL 1851

WF 5

HEAVIER CUTS IN HARDER MATERIALS AT HIGHER SPEEDS

Get More Production with GORHAM "M-40-B" Tool Bits!

Get more out of your machine tools . . . raise your production curve . . . with Gorham "M-40-B" turning tools! Use "M-40-B" wherever the application of a Super High Speed Steel is indicated, as in machining heat treated alloy steels with large amounts of stock removal at high surface speeds.

"M-40-B" is a Super Moly grade with performance characteristics comparable to those of super tungsten high speed steel. It has extremely high red hardness, high Rockwell hardness, and offers maximum toughness and abrasion resistance. You can take heavy roughing cuts with it at high surface speeds and feeds . . . use it for high speed finish cuts as well.

"M-40-B" comes in square tool bits, 11 stock sizes, and in 23 stock sizes of rectangular turning tools. Bits and turning tools are accurately ground, uniformly hardened, ready to sharpen. Special sizes and shapes to your order. Illustrated with prices are three popular size "M-40-B" tool bits. See your distributor, or send direct for a trial order.

"M-40-B" is one of three cutting tool materials developed by Gorham. Others are Gorham "Standard", for the commercial field, and "Gormet", for turning soft or abrasive stock. They're completely described, with size and price lists, in a new free bulletin. Send for your copy today.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS
TO THE EDITORS

Need for STEEL Is Varied

Due to the fact that we are considering starting a small rolling mill in this city, we would like you to send us STEEL each week, starting as soon as possible.

What we have in mind is the purchase of an electric furnace from 3 to 5 ton capacity to melt our steel scrap, pour it into billet moulds, reheat the billets in a rotary hearth oil or gas fired furnace and re-roll it into deformed reinforcing bars from $\frac{3}{8}$" to $1\frac{1}{4}$" diameter.

F. L. Irving
Foothills Steel Foundry & Iron Works Ltd.
Calgary, Alberta

. . . . Please enter my subscription to STEEL . . . Where can I obtain current domestic and world prices on basic ores such as iron, manganese, tungsten, fluorspar, chrome and others?

Fred G. Riesen Jr.
Fred G. Riesen Jr. Co.
Oconomowoc, Wis.

• *STEEL carries many of these prices each week in its market price section.*

Who and Where Department

Where may we obtain the double strip accumulator pictured on p. 95 of STEEL for Feb. 15, 1952?

D. Gahan
Acme Roofing & Termite Co.
San Antonio

• *Contact Gasway Corp., 6463 N. Ravenswood Ave., Chicago.*

Who is the manufacturer of equipment for the "electrostatic method" of painting (Aug. 6, p. 80; Sept. 3, p. 94).

Burl Thompson
Thompson Book & Supply Co.
Ada, Okla.

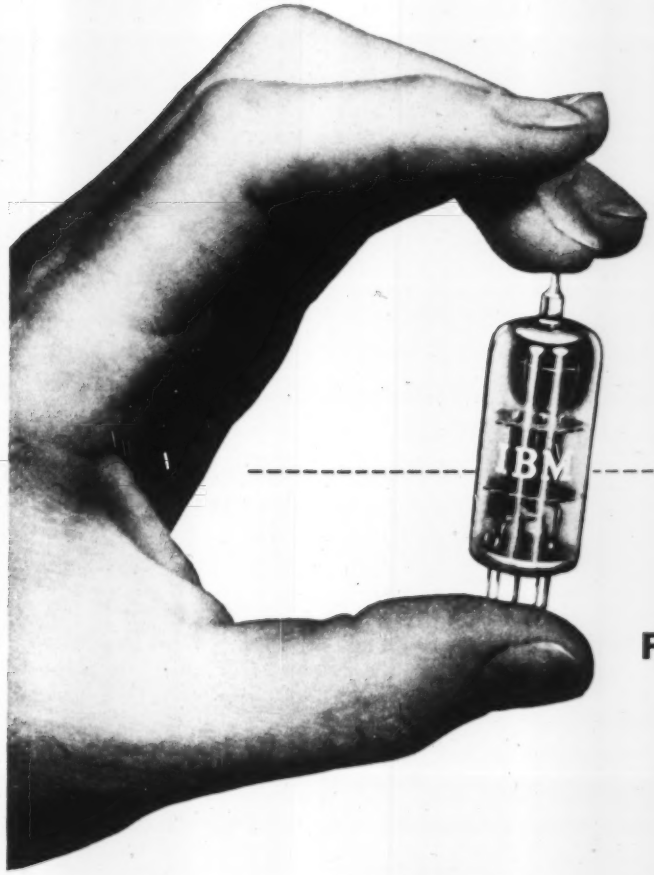
• *Contact either Ashdee Products Co., Homewood, Ill., or Ransburg Electro-Coating Corp., Indianapolis.*

Design Makes a Difference

Who designed the remodeling of Heppenstall Co.'s Pittsburgh office with 17 per cent straight chrome stainless?

F. J. McNiff
Crucible Steel Co. of America
New York

• *For information write to Hoffmann & Crumpton, Century Bldg., Pittsburgh.*



Today

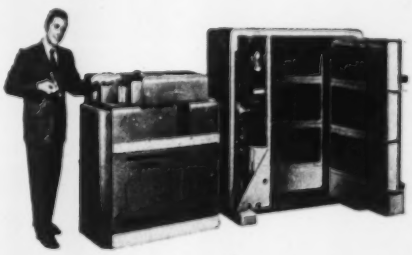
FASTER ACCOUNTING FOR THE STEEL INDUSTRY

...with **IBM** *Electronic Business Machines*

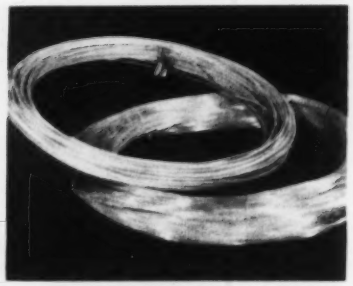
IBM Machines simplify the tremendous accounting job of the steel industry.

Electronic tubes enable these machines to process huge quantities of accounting and statistical data at speeds unprecedented in industry—and with uncanny accuracy. Results range from the performance of day-to-day accounting to the preparation of payrolls complicated by many pay methods and rates, special allowances, and deductions . . . all on an up-to-the-minute basis.

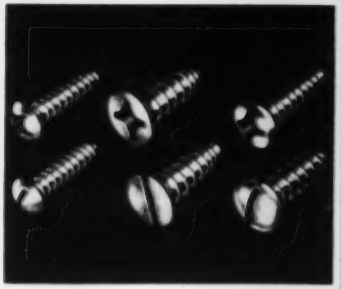
With the flexibility and speed of these machines at its command, management has at its fingertips information about every phase of operations.



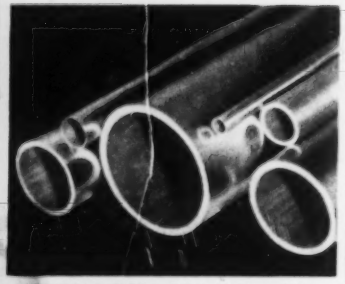
INTERNATIONAL BUSINESS MACHINES
590 Madison Avenue, New York 22, N. Y.



WIRE—Coiled and straight lengths; rivet wire, flattened and slit wire.

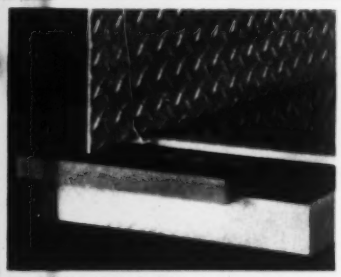


FASTENERS—Machine screws, wood screws, washers, nuts, bolts, rivets.

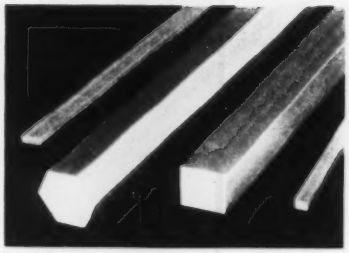


TUBE AND PIPE—Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.

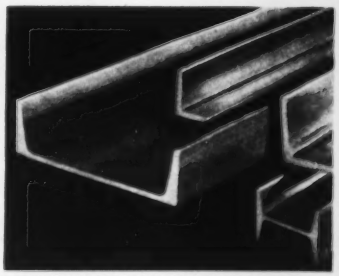
These are the MILL PRODUCTS *of* ALCOA



SHEET AND PLATE—Flat and coiled sheet; circles; patterned sheet; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK—Square, hexagonal and rectangular bar stock in free-cutting and higher-strength alloys.



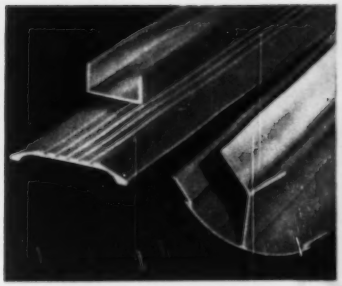
ROLLED SHAPES—Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.

"SEE IT NOW," with Edward R. Murrow, brings the world to your armchair . . . CBS-TV every Sunday—3:30 P. M. EST

ALUMINUM COMPANY OF AMERICA

SCREW MACHINE STOCK—All free-cutting alloys plus the higher-strength alloys—24S, 61S and 75S.

WELDING AND SOLDERING SUPPLIES—Welding and brazing wire, welding and brazing flux, solder flux, solder.



EXTRUDED SHAPES—Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners, structural members, etc. Round, square and rectangular bars.

They have these 12 basic advantages and scores of others

- Light Weight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Non-Toxic
- Strength in Alloys
- Non-Sparking
- Non-Magnetic
- Appearance
- High Scrap and Re-Use Value

They are available from your local ALCOA sales office, distributor or jobber subject to government regulations

For help in interpreting government regulations and all possible co-operation in filling your rated orders, call on your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

With them goes the skill in fabricating, assembly and finishing of 64 years of aluminum knowledge

This know-how plus the help of the world's greatest aluminum research and testing facilities is available to you through your local Alcoa sales office.

There are no restrictions on the aid and know-how that go with them

For technical literature and movies to train your personnel, for the personal help of Alcoa sales engineers, for the long-range research and testing of aluminum for your products, call your local Alcoa sales office.

ALUMINUM COMPANY OF AMERICA
1808C Gulf Building • Pittsburgh 19, Pa.

ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS
sand, plaster, permanent mold and die

FORGINGS
drop, hammer and press forgings

EXTRUDED SHAPES

IMPACT EXTRUSIONS

SCREW MACHINE SPECIALTIES
special fasteners and screw machine parts

ALCOA *first in* ALUMINUM

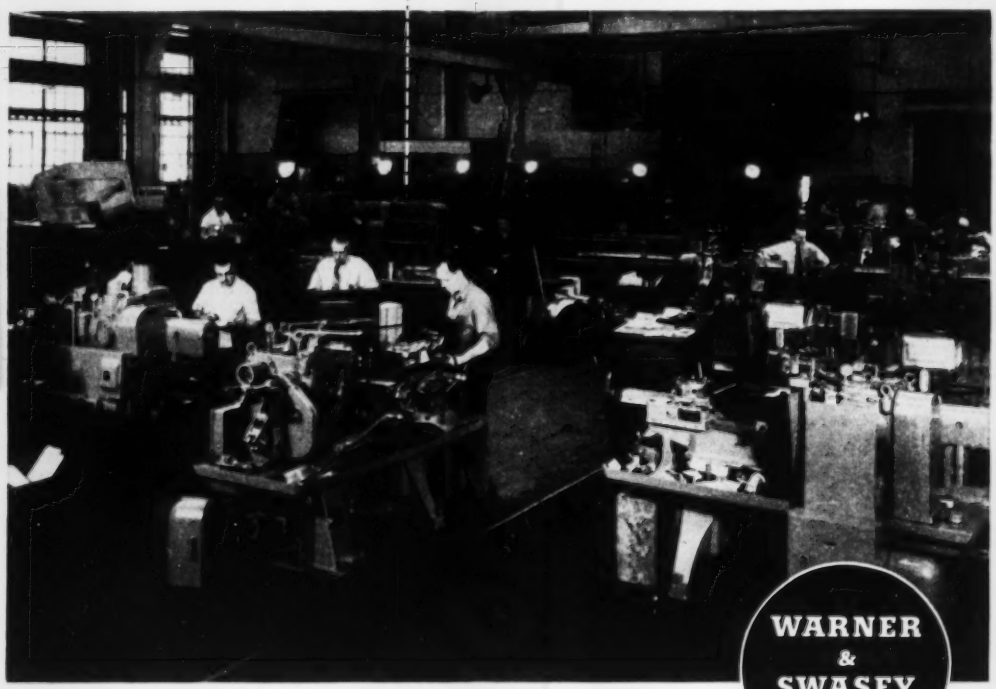
Our severest critics are right in our own plant!

● Contrasting with the constant pressure for production in other departments at Warner & Swasey is the calm, methodical work of one group of our men. These men are our severest critics—our final inspectors.

By the time an assembled turret lathe reaches one of these final inspectors, its individual parts have already passed 15,000 inspections!

But that is not enough! The final inspector carefully rechecks the completed machine—*proves* beyond doubt that it is ready to turn out the high precision work for which it is designed. Only then does he *sign his name* to a written report certifying that the turret lathe he passes is as perfect as human skill can make it.

Like our other departments, "final inspection" is working day and night to get machine tools to our shipping platform on schedule. But despite stepped-up production and urgent delivery dates, *no* machine leaves our plant until it meets the long-established Warner & Swasey standards for accuracy and dependability.



WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

"I wonder what happened to me !", said Alice

ALICE in Wonderland ate the magic cake and grew until she was more than nine feet tall. Our National bureaucracy also seems to have partaken of the magic cake of power. Bureaus in our government have grown in number and scope until their activities now control, to a great extent, the lives of all individual Americans. Department after department adds more and more people -- state, justice, commerce, treasury -- not to mention those sprawling emergency born agencies of price control, N.P.A. and other alphabetical subdivisions.

The number of employees of our federal, state and local governments continues to grow. During many recent months, personnel was added to the federal payroll at the rate of 1,500 daily.

What is the reason for this mushrooming? The Korean War? Threat of war in Europe, Southeast Asia, or the Middle East? Obviously not! A glance at the federal budget gives the answer. The estimated cost of all governmental functions for the fiscal year 1952 is in excess of 70 billions of dollars, an increase of 26 billions, or approximately 60% more than last year.

When will it end? Only you, the individual citizen, who carries the bureaucratic load on his back, can stop it. It will end when enough patriotic men and women demand from congress that the Washington Wonderland start shrinking back to reasonable proportions.

YOUR SCRAP IS NEEDED — YOUNGSTOWN

The Youngstown Sheet and Tube Company

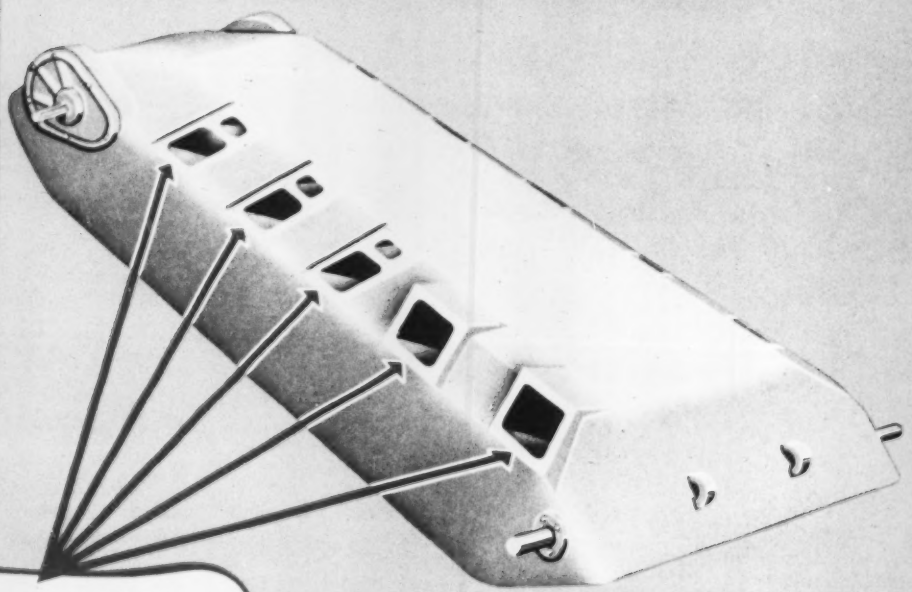
General Offices -- Youngstown 1, Ohio
Export Offices -- 500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment

Problem...

HOW TO GRIND TANK HULL SUSPENSION MOUNTING PADS AT PRODUCTION SPEEDS . . .



Hard-to-get-to suspension mounting pads that had to be precision machined. The tough armor plate resisted existing methods.

PROBLEM . . .

Machining mounting surfaces for suspension assemblies on the underside of tank hulls consumed so much time that it slowed production throughout a vast tank plant. The machining had to be done on an angular surface on tough armor plate. It had to be extremely accurate. Each hull required ten separate setups, these done one at a time on a horizontal boring mill.

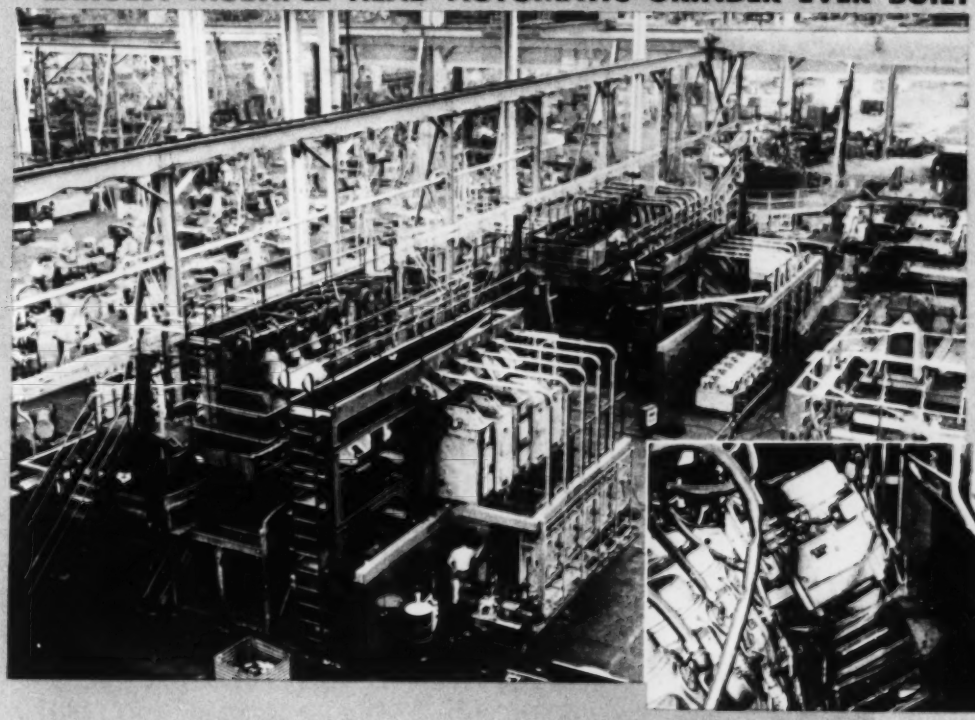
To iron out the bottle neck meant either one of two things. The company could add boring mills, or devise a machine to do the job. Adding mills would require a great deal of added space, the training of more operators, and a multiplication of the problems encountered in using a machine for a job for which it was not exactly suited.

SOLUTION . . .

The manufacturers contacted the Wean Equipment Corporation and outlined their problem. Wean set to work. Within a few months they had engineered a grinding machine that did the job 22 times faster than the old method. It is the largest multiple head grinding machine ever devised, and the first completely automatic adaption of a bank of grind-

Solution...

LARGEST MULTIPLE HEAD AUTOMATIC GRINDER EVER BUILT



ing heads to work on an angular surface. Weighing 350 tons, the Wean Grinding Machine grinds all ten surfaces simultaneously, and eliminates the possibility of human error in controlling the grinding head. Each of the 10 grinding heads is independently controlled and completely automatic. As the head moves back and forth across the surface of the mounting pad the depth of grind automatically increases with each pass. When the required depth is reached, the circular motion of the abrasive wheel stops and the grinding head withdraws. Automatic wheel dressing or cleaning removes all built up residue on wheel surface.

The intricate control system contains 15 miles of electric wire, hundreds of feet of pipe and 60,000 electrical connections, yet an operator can be trained to operate the machine in a single day.

THE ANSWER IS RESULTS . . .

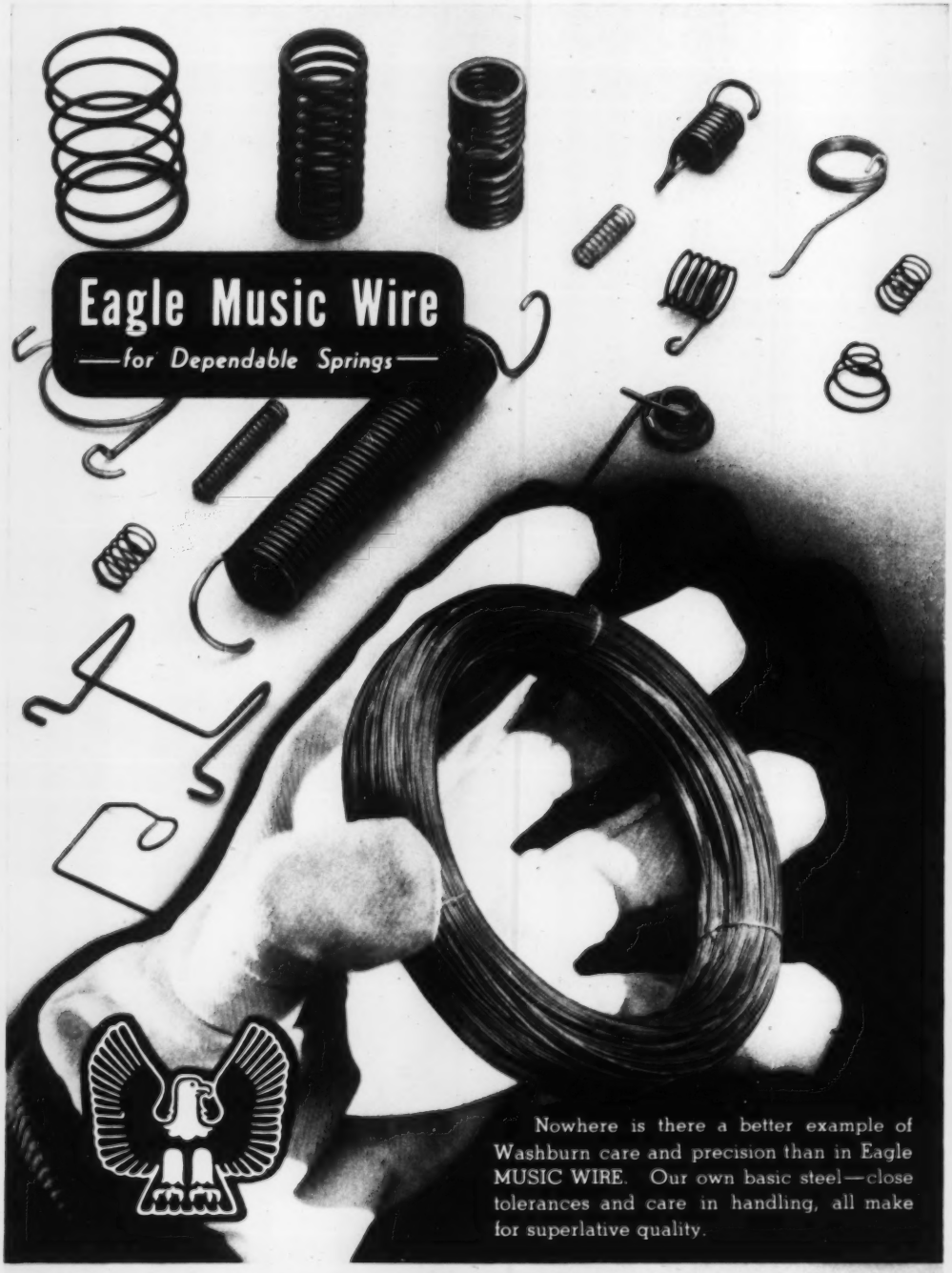
The manufacturer, anticipating even greater production, has ordered a second grinding machine.

Getting results — finding the answers to the tough problems is why the Wean Equipment Corporation is a recognized leader in the field of special machinery for industry.

MACHINERY TODAY IS THE BUSINESS OF THE

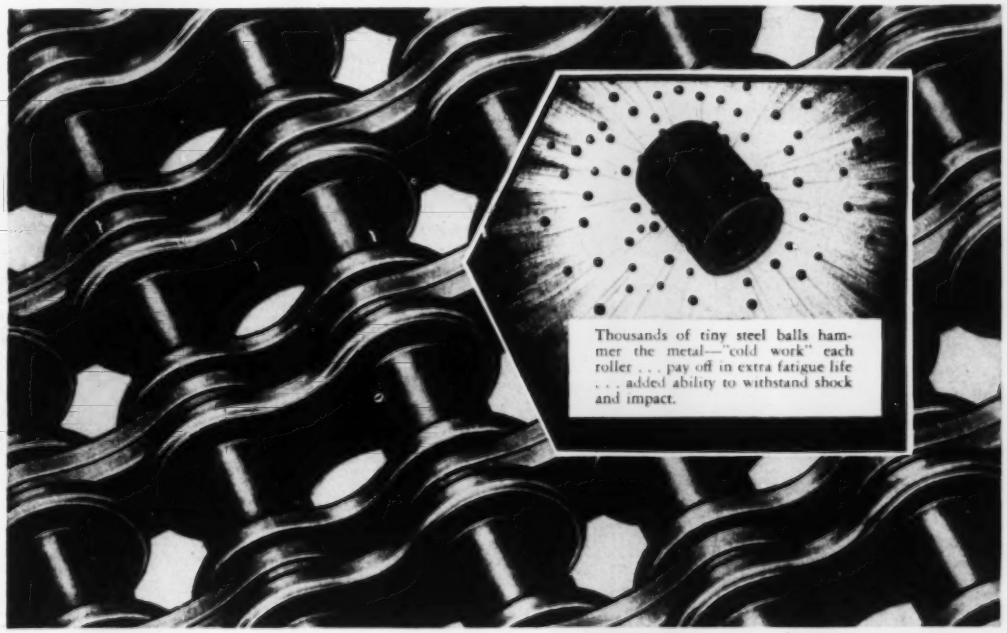
Wean EQUIPMENT CORPORATION

Cleveland, Ohio


Eagle Music Wire
—for Dependable Springs—
Nowhere is there a better example of Washburn care and precision than in Eagle MUSIC WIRE. Our own basic steel—close tolerances and care in handling, all make for superlative quality.

WASHBURN WIRE CO., New York City

Get the roller chain that gives you SHOT-PEENED rollers...


Thousands of tiny steel balls hammer the metal—"cold work" each roller . . . pay off in extra fatigue life . . . added ability to withstand shock and impact.

look for the darkened rollers!

THERE are sound reasons for the universal acceptance of Link-Belt Precision Steel Roller Chain. Two of them—shot-peened rollers and Lock-type Bushings—are shown here.

Others include Link-Belt's rigid material selection and controlled heat treating—your assurance of absolute uniformity with no weak members.

Whether it's for drive or conveyor service, you can get the best in roller chain from the complete Link-Belt line—single and multiple widths, in ⅜" through 3", and double pitch, 1" through 3". Next time you need roller chain, call the Link-Belt office near you.

LINK-BELT

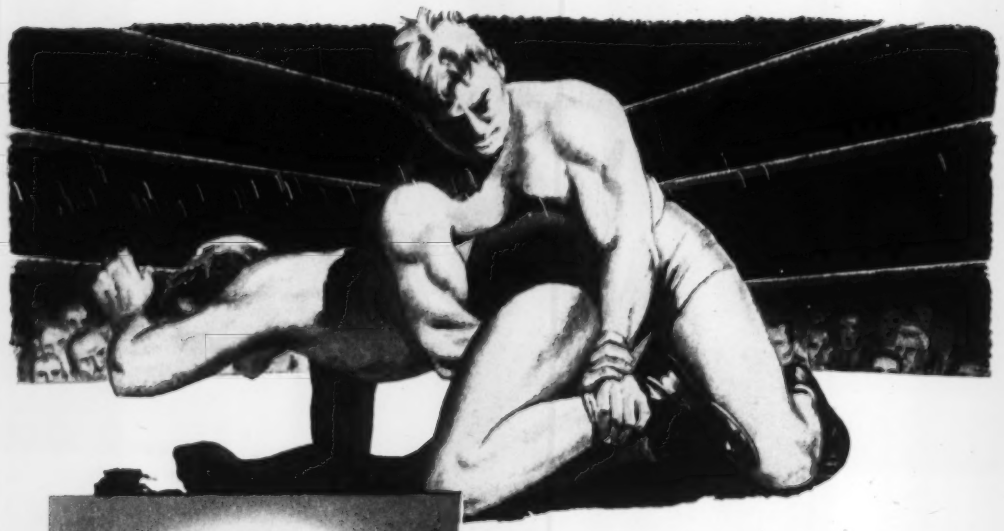
PRECISION STEEL ROLLER CHAIN

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 52.617

Lock-type Bushings increase ability to withstand shock loads

A special manufacturing process securely locks the inside sidebars on the bushing, preventing lateral movement of the sidebars and eliminating a common cause of stiff chains. This Link-Belt development is applied on roller chains through 1" pitch and double pitch roller chains through 2" pitch.

Dayton Cog-Belts* *bend* better



Dayton raw-edge Cog-Belts are the *only* V-Belts scientifically designed to bend as easily as your finger. The cogs "close up" —take up the compression as the belt goes around the pulley. Result: Less strain . . . cooler running . . . smaller pulleys . . . 40% more horsepower . . . much longer belt life.

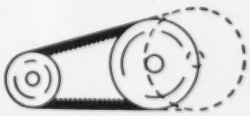
...*are* better!

See HOW MUCH better Cog Belts are!

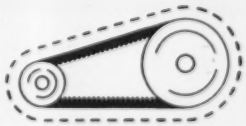
This V-Belt drive transmits the power from two diesel engines to a dredge pump, which delivers 100 cubic yards of sand and gravel per hour. The former drive used 16 ordinary V-Belts which were capable of handling 140 constant horsepower. But the dredging company wanted to step this up to 188 horsepower, to meet new production requirements. Trouble was, the increased load meant adding more belts—*and there was no room for pulleys with more grooves!* The Dayton Distributor simply put Cog-Belts on the drive. Now the same number of belts carry the increased load—and the dredge's space problem is solved. Whether *your* drive problem is *space, cost,* or *longer life,* it will pay you to look into the advantages of the Dayton Cog-Belt. It delivers more power!

ONLY THE DAYTON COG-BELT GIVES YOU THESE ADDITIONAL ADVANTAGES

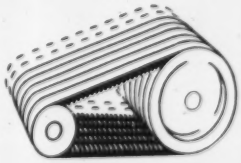
25% shorter center to center pulley distances



Smaller pulleys . . . shorter belts . . . 47% less drive space



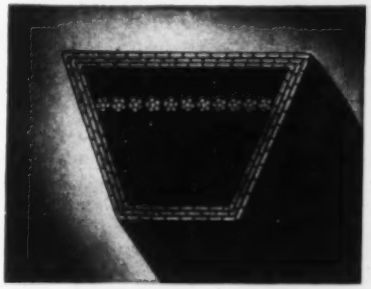
Fewer belts! Cogs transmit 40% more horsepower. 5 Cogs do the work of 7 ordinary V-Belts!



For Regular Drives...The Dayton Thorobred V-Belt is Tops!

The Dayton Thorobred V-Belt is the V-Belt for standard drives. Its patented, three-prime-section design, containing high-tenacity rayon cords, and its durable double wrap, result in exceptionally long life. The Dayton Thorobred V-Belt has set completely new standards for long life and trouble-free service at minimum cost. It can serve YOU!

© D.R. 1952



*T.M.

See "Belting" in the yellow pages of your local telephone directory for the Dayton V-Belt Distributor. Let him solve your drive problems!

Dayton Rubber

Since 1905

World's Largest Manufacturer of V-Belts

DAYTON RUBBER COMPANY • DAYTON 1, OHIO

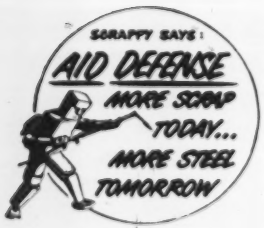
Don't you let this happen...

WEATHER
The D r Home Journal
FINAL
SCRAP METAL FAMINE CUTS STEEL PRODUCTION
Critical Shortage Threatens Shutdown to Many Industrial Plants

Start a SCRAP round-up Today!

Are your business and the national defense program threatened by an impending steel shortage? The answer is an emphatic *yes.*

Steel mills everywhere report scrap inventories at a dangerous low. Indeed, some furnaces have already been shut down for lack of iron and steel scrap. Others are sure to follow unless stockpiles are rapidly built up.



WHAT CAN YOU DO ABOUT IT? Start a scrap round-up! Go over your plant with a fine-tooth comb, reclaiming every pound of iron and steel that is not being used. Then get in touch with your local scrap dealer. Remember, every little bit will help America meet this crisis. Every little bit will help insure your working future.

WEIRTON STEEL COMPANY

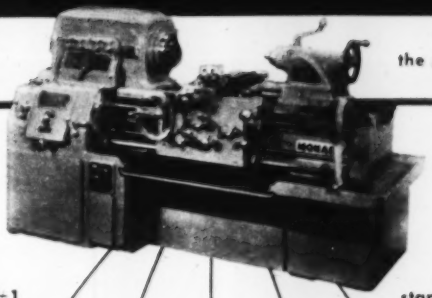
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

HERE'S YOUR IDEA ORGANIZATION CHART

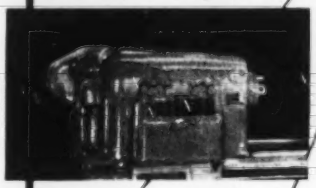
for Small Lot Production and Maintenance

here's the basic design—
in 13", 16" and 20" swings

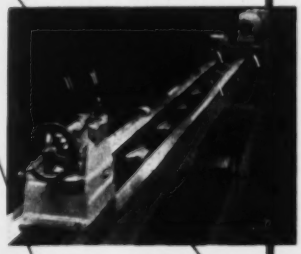


the Monarch series 60 lathe

standard variation #1
series 60 plus—swing models



standard variation #2
series 60 long bed models



multiple positive carriage stop | ball turning rest | micro-gage dial | spindle nose chucks and collets | anti-friction bearing taper attachment

AND HERE ARE TYPICAL MONARCH SERIES 60 ACCESSORIES

This, of course, gives you only a partial idea of the great versatility of the Monarch Series 60 —available both as an Engine and a Toolmaker's Lathe. But it does indicate the ease with which the competent basic model can be customized to meet your requirements beyond those served by our standard design. It doesn't show *all* the accessories—the real inside story of Monarch specifications and construction—or the Monarch Heavy Duty Line with added power and swing. For the whole story, you'll want the illustrated, detailed Booklets that we have prepared. Just fill in the coupon, indicating your special interests ... *The Monarch Machine Tool Co., Sidney, Ohio.*

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A GOOD TURN FASTER...TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO

Gentlemen: Please send me without obligation the following Complete Booklets.

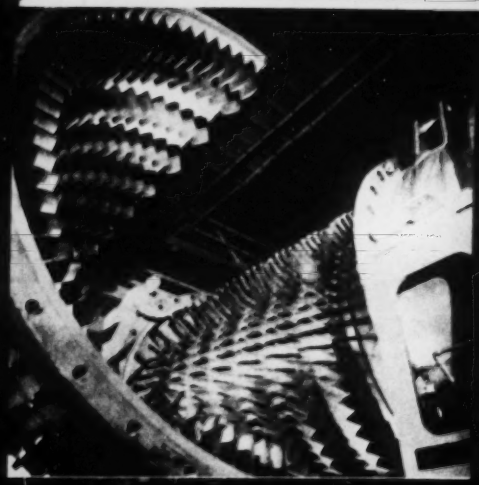
- ☐ Booklet No. 1113—Monarch Series 60 Lathes
- ☐ Booklet No. 1208—Monarch Heavy Duty Lathes

NAME _____ TITLE _____

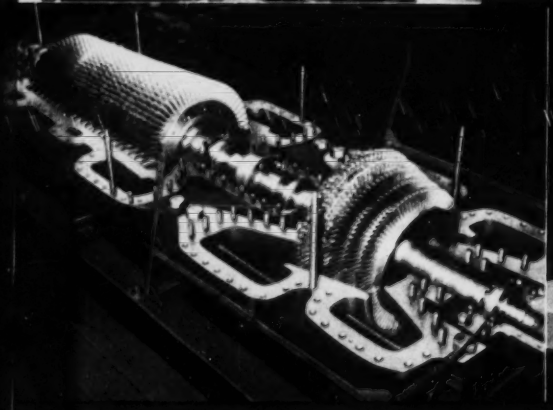
COMPANY _____

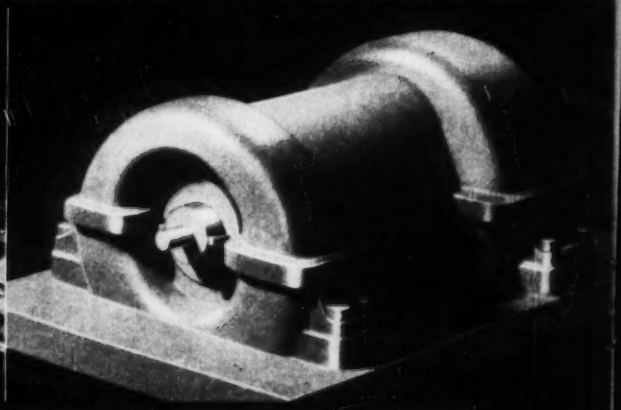
ADDRESS _____

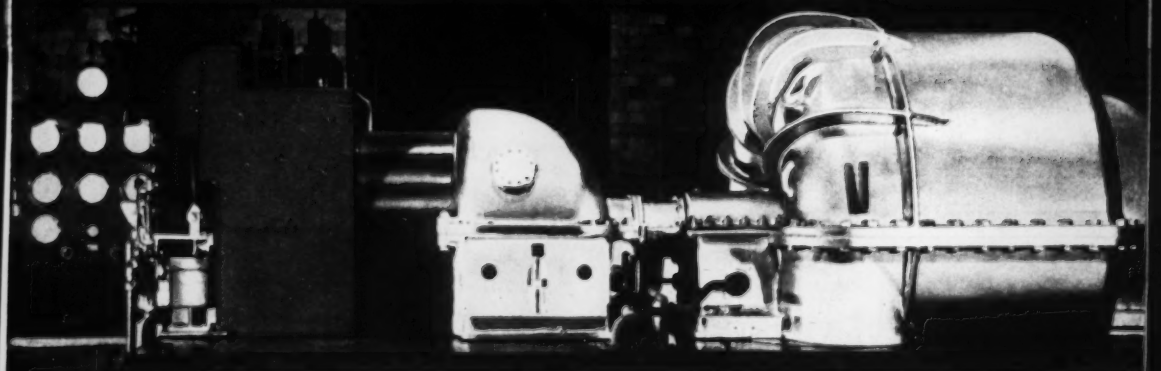
CITY _____ ZONE _____ STATE _____



WANTED:







Allis-Chalmers has wide experience in designing and building air moving equipment for all industries. Shown here is an A-C 75,000 cfm, 30 psig blast furnace blower at a midwestern steel mill. This is of the centrifugal type, driven by A-C 8500 hp steam turbines.

ALLIS-

Job Moving Air

...Quantity No Object!

ALLIS-CHALMERS OFFERS AXIAL COMPRESSORS FOR BLAST FURNACE BLOWING

THE TREND TO HIGH TOP PRESSURE and larger air volumes in blast furnace blowing finds the efficient and field-proven axial compressor ready and able to supply the largest projected blast furnace or combinations of furnaces!

Allis-Chalmers — builders of both axial and centrifugal compressors — is now offering axial compressors for blast furnace service at volumes over 100,000 cfm, and at pressures of 30 psig and higher. With comparable first cost, steam savings on the order of 15 percent are possible because of axial "straight-through" air flow and higher speed operation.

An axial compressor of 110,000 cfm, 30 psig in routine blast furnace service would require 72,100 lb of steam per hr at 600 psig, 825 F, as compared to 85,800 to drive a like centrifugal unit. Installation space and foundation costs are also reduced, since the higher rotative speed makes the axial unit shorter, more compact and lighter.

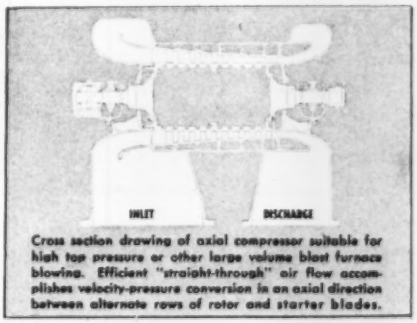
As air volumes increase, the axial compressor rapidly becomes the only practicable method. The air volumes required for even the largest foreseeable blast furnace application present no new design problems for an axial compressor. And wear-resistant alloy, precision cast blades are ideal for contaminated atmospheres.

One Allis-Chalmers axial (see upper left) has operated for four years at an output of 870,000 cfm! A-C axial design and construction have been well proven in the past 15 years with nearly *four million* cfm in capacity already in use or under construction for the petroleum, aircraft, railroad, and gas utility industries.

Blast furnaces can have their progress to more efficient size and pressures *aided* by adopting the more efficient axial compressor. Get the *full* story on how an Allis-Chalmers axial can best solve your need for large air volumes.

There is a qualified steel mill representative near you, ready to explain the axial compressor in detail. Just call the nearest A-C sales office or write for literature to Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3661



Cross section drawing of axial compressor suitable for high top pressure or other large volume blast furnace blowing. Efficient "straight-through" air flow accomplishes velocity-pressure conversion in an axial direction between alternate rows of rotor and starter blades.

SINGLE STAGE BLOWERS available in pressure ranges from one to 6.50 lb. Rigid, long-lived cast casing can be arranged to any one of 24 discharge positions.

ROTARY COMPRESSORS, sliding vane type. Capacities for 5 to 35 psig. Air is compressed in cells formed by blades moving freely in and out of longitudinal slots in rotor.

DRY VACUUM PUMPS. Range to 28½ inches hg vacuum. Same principle as rotary compressors except that action is reversed—inlet evacuates, exhaust is open.

CHALMERS A-C ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Iron and Steel

SCOVILL BRASS

CONTINUOUS-CAST
for Soundness and Uniformity

Superior soundness and ductility of Scovill Strip and Sheet increase your working limits, promote maximum tool life, permit sharp bends, and extra deep draws as normally associated with each specific alloy.

Your machines can operate at highest permitted production speeds because of the uniformity of chemical composition, temper, and thickness from strip to strip and sheet to sheet throughout each unit length. Machine slowdowns or shut-downs from common metal irregularities are held to the minimum.

You benefit because Scovill uses all the facilities of copper-base metallurgical and chemical knowledge plus most modern quality control systems on all operations.

"You can't buy better brass"

CONTINUOUS-CAST SPECIALTIES INCLUDE:

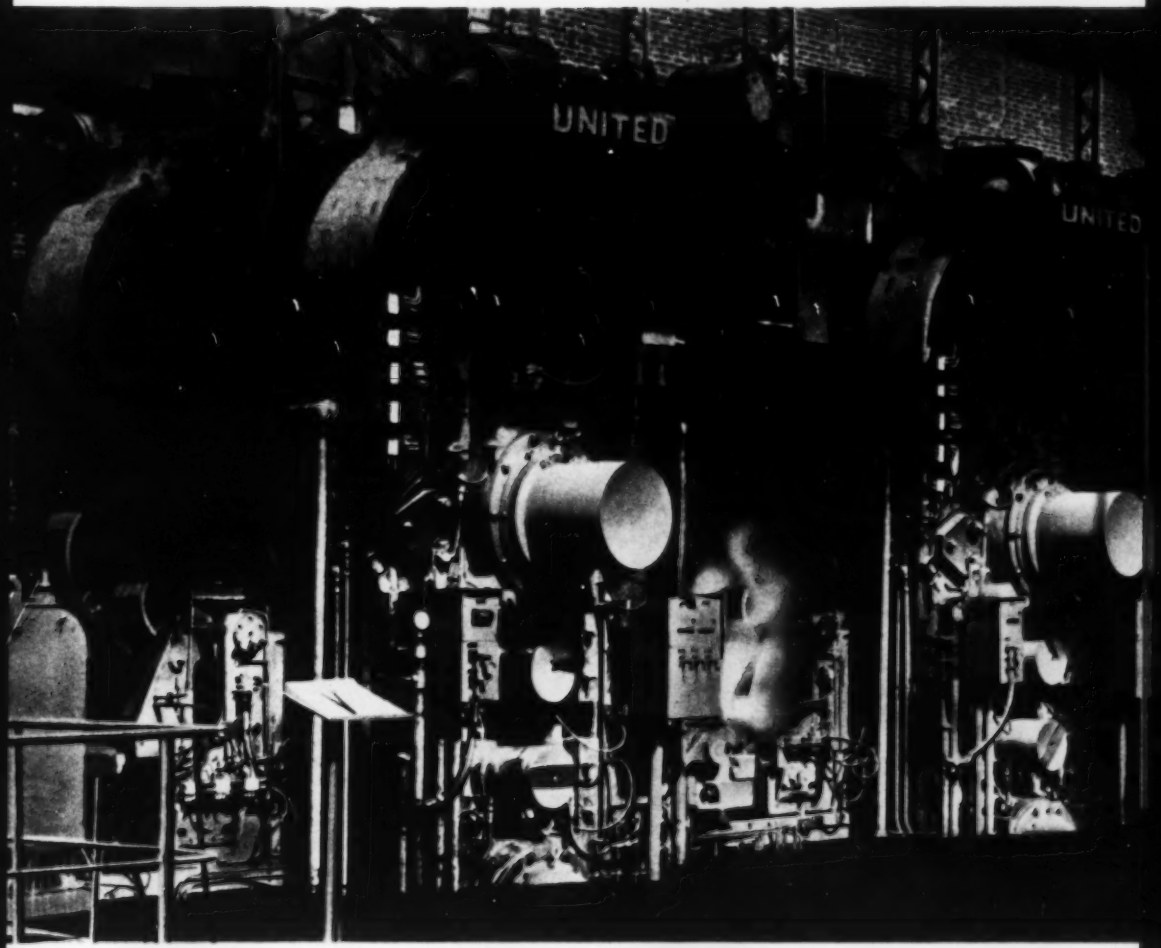
- **Brass Strip and Sheet** *(Copper-Zinc Series)*
- ***High Speed* Brass Rod** *(Free-Cutting)*
- **Extruded Cold-Heading Wire** *(Cartridge Brass, 70%)*
- **Phosphorized Admiralty Condenser Tube**
- **Standard Forging Brass** *(Alloy No. 284)*

BRASS MILL PRODUCTS IN A COMPREHENSIVE RANGE OF COMMERCIAL ALLOYS, SHAPES, TEMPERS AND SIZES

★ Scovill Manufacturing Company, 83 Mill St., Waterbury 20, Conn. ★

UNITED

4-HIGH 6-STAND CONTINUOUS HOT MILL



UNITED

ENGINEERING AND FOUNDRY

COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at PITTSBURGH • VANDERGRIFT • NEW CASTLE
YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

YOUR GEARS LAST MUCH LONGER

. . . when protected with TEXACO MEROPA LUBRICANT

Here's the big reason why your enclosed reduction gears run better and last longer with *Texaco Meropa Lubricant:* its "extreme pressure" characteristics stand up through month after month of the severest service.

Along with this EP stability, *Texaco Meropa Lubricant* has extra-high resistance to oxidation and thickening. It does not foam; will not separate in service, storage or centrifuging. Bearings as well as gears get extra protection. Your maintenance costs come down.

FOR OIL FILM ROLL NECKS, use *Texaco Regal Oil*. This turbine-quality oil for heavy-duty service has superior resistance to oxidation, emulsification and sludging. You'll get smoother operation, reduce your maintenance costs.

Let a Texaco Lubrication Engineer show you how effective lubrication — *Texaco* — can step up efficiency and step down costs throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO Meropa Lubricants
FOR STEEL MILL GEAR DRIVES

Faithfully yours 50 *for Fifty Years*

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

March 24, 1952

Higher Rations for Appliances?

Metal rations for manufacturers of civilian hard goods will be boosted after July 1—providing there's no long steel strike. NPA's Consumer Durable Products Division recommends that enough metals be made available in the third quarter to provide amounts in these percentages of base period use: Carbon and alloy steel 65 per cent; brass mill products 40 per cent; wire mill products and aluminum 50 per cent. Consumer durables in the second quarter are slated to get this: Steel 50 per cent; brass mill products 30 per cent; wire mill products 35 per cent and aluminum 30 per cent. The $64 question is: Can appliance makers sell the extra units the added allotments will permit them to produce? (p. 43).

The Amber Light on Decontrol

Washington controllers of metals distribution and prices have the White House o.k. to proceed more speedily with decontrols. The administration has decided it will be good politics for the moment to give, if not the green, at least the amber light on the program. Nor may the gesture cost the Democrats one iota in their grip on the economy because they're well aware that a long steel strike would give them the excuse to reinstate all restrictions. Price Stabilizer Ellis Arnall says he'll start decontrolling some prices in about 10 days.

Steel Defense Shipments Soar

Steel shipments to makers of guns, ammunition, tanks and similar products is rising sharply and will continue to increase. Deliveries in January rose to 163,617 tons or 2.5 per cent of total steel for the highest monthly figures since World War II. Shipments to defense-related industries are also gaining. Manufacturers of machinery, industrial equipment and tools, other than electrical equipment, were shipped 400,242 tons or 6.3 per cent of the total in January.

More Jets by Yearend

Jet aircraft production by the end of 1952 will be two and a half times what it was at the beginning of the year. So predicts Defense Mobilizer C. E. Wilson who spoke at General Electric Co. celebrations last week in Cincinnati and Lockland, O., commemorating the tenth anniversary of the development of the jet engines in the U.S. At the ceremonies GE disclosed it's producing an advanced model jet engine 10 per cent more powerful than types now in Korea. Designated the J47-GE-27, the engine will give the North American F-86 more than 5800 pounds.

Fast Six Years in Armaments

The development in jets lends support to Air Force Secretary Finletter's statement that "the advance in all sorts of weapons, not only in air weapons, since the end of World War II has been greater than the advance from the time of the invention of gunpowder until the end of

Production Engineering News—p. 67 The Market Outlook—p. 125

World War II." Those advances mean radically new tools, including the big presses to forge or extrude large parts for jet airframes. Planned are 17 units to cost—including ancillary equipment—$500 million. Eight of the 17 have already been ordered (STEEL, Mar. 10, p. 78); two more have just been ticketed for Kaiser Aluminum & Chemical Corp. which will build a $9 million plant at Halethorpe, Md., to house them.

Bottleneck Breaker

Most manufacturers welcome the new speedup procedure for breaking production bottlenecks in high urgency military items. The shortcuts permits a company turning out military items, which the defense secretary terms urgent, to appeal directly to NPA if, after five days, the military agency expediting the handling of the choke-point hasn't solved the problem.

Nearly Enough Sulphur

Essential sulphur requirements by metalworking will be met in the second quarter. Supplies in the coming three months will about equal those of this period. A heavy expansion program in the sulphur industry will enable producers to turn out 7.1 million long tons a year by 1954, about 8.4 million tons by 1955. By the latter date the problem should be completely solved.

Defense Housing Snags

Watch for a public flare-up about defense housing. The job of designing and producing the 72,000 units so far programmed in critical defense areas by Uncle Sam is not progressing well. Builders, all set to erect the projects, can't find enough mortgage money and have discovered that many of the areas picked by the government lack utilities, sewers, streets and schools.

Straws in the Wind

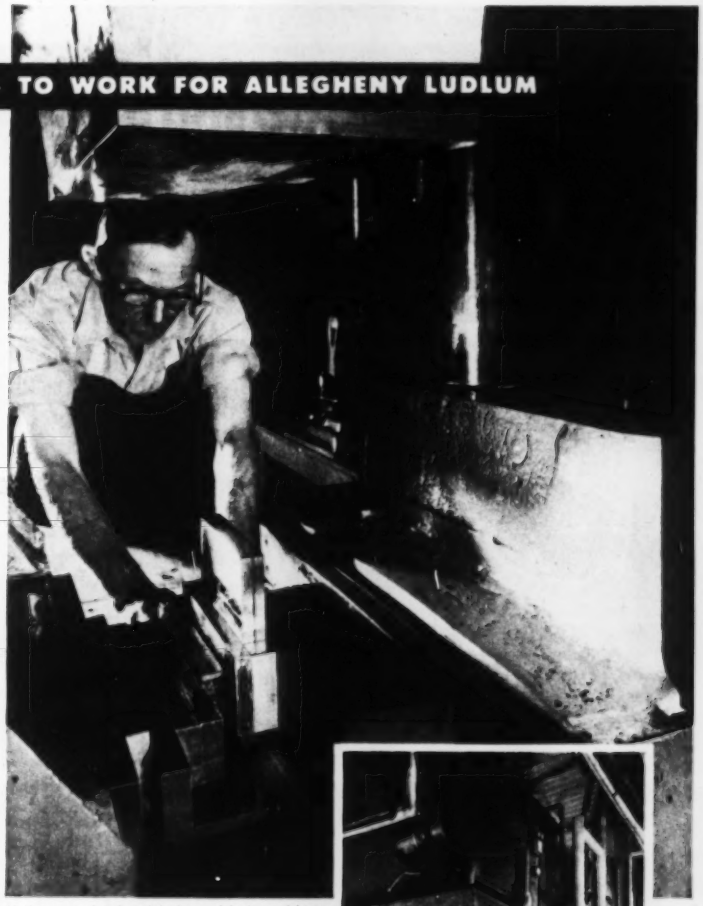
General Electric Co. has cut atomic hydrogen welder prices $200 . . . A high DPA official promises the nation's foundries enough defense orders for heavy castings to bring them close to capacity production within the next three or four months . . . Iron ore from Labrador and Quebec may move to Canadian steel mills by the summer of 1954, a year early . . . Allegheny Ludlum Steel Corp. is using manganese to replace most of the nickel in a new group of stainless steels.

What Industry Is Doing

The government has had the steel case nearly three months but still can't come up with recommendations until the eleventh hour (p. 39) . . . Construction will be among the first industries to benefit substantially from decontrol—if there's no long steel strike (p. 40) . . . Industry's productive capacity will increase 8 per cent in 1952 (p. 41) . . . Pointed up at the American Society for Tool Engineers show was this problem: How to keep up production in a dual economy (p. 43) . . . British Conservatives have trouble making good on their promise to denationalize steel (p. 49) . . . Manufacturers' agents do well, even in our defense economy (p. 50) . . . One of man's most ancient tools, the file, keeps pace with technological change (p. 51).

PUTTING *Air* TO WORK FOR ALLEGHENY LUDLUM

THIS MOLDING OF METALS NEEDS PERFECT AIR



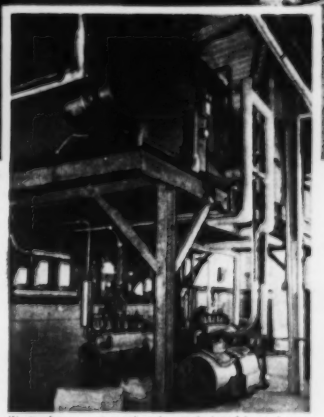
If these powdered metals have picked up airborne impurities, they will not bond properly no matter how much pressure is applied.

Molding powdered tungsten and cobalt under pressure to form carbide tool bit blanks is tricky. Tungsten, high on the list of critical metals, is extremely vulnerable to oxidation in moist air. Airborne contaminants cause flaws, too, which would be reflected in the quality of the finished tools and bits and by irregularities in their working life.

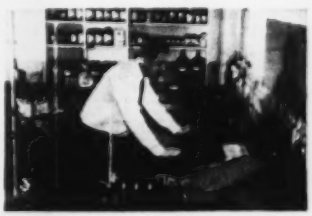
Carefully controlled, filtered air is a basic requirement, so Westinghouse* helped Allegheny Ludlum's Carmet Division *put air to work* regulating the humidity to prevent oxidation and raise quality. The air is kept free of impurities by PRECIPITRON®, the electronic air cleaner that is many times more efficient than mechanical filters.

What's your air control problem? If it involves air conditioning, air cleaning or air handling, there's a complete line of reliable, industry-proven Westinghouse equipment to fill your needs. Call the Westinghouse Air Conditioning Distributor listed in the Yellow Pages, or write Westinghouse Electric Corp., Air Conditioning Division, Hyde Park, Boston 36, Mass.

*Installation by Mechanical Heat & Cold, Inc., Detroit, Michigan.



Westinghouse equipment parts are designed to work perfectly together, will install in a minimum of space



Atmospheric conditions in the quality control lab must be constant, matching those in the manufacturing areas.

YOU CAN BE SURE...IF IT'S

Westinghouse

J-80251

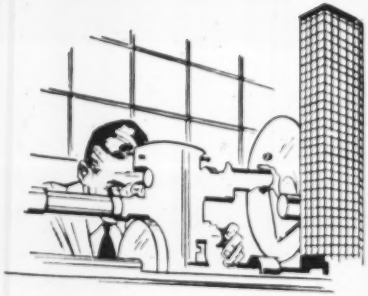
If you are starting from scratch...

Are you ready to put a new or redesigned product on the drawing board – perhaps with the idea that you will start production when materials are more plentiful?

steels are different

When you decide it's "time to design," our experienced engineers would like to demonstrate the advantages of modern sheet steels. You'll find them different – much different than those available to manufacturers a decade ago.

YOUR needs come first



Because Armco produces *special-purpose* sheet steels, our research men and mill technicians are alert to the needs of fabricators for better-looking and longer-lasting products.

wide variety of steels

This has resulted in a new "wardrobe" of coatings for many Armco sheet steels. Sheets coated with aluminum, special zinc coatings and special Bonderized surface treatments are a few.

Besides coated steels, solid Armco Stainless Steels are produced in a wide variety of grades and forms. Armco Enameling Iron is another.

write for catalog

These special steels and durable stainless steels help underscore the advantages of sheet steels —their strength, resistance to impact, shock, abrasion and corrosion, and heat resistance.

For data on Armco Special-Purpose Sheet Steels, see our insert in Sweet's Catalog for Product Designers. Or write us for a copy.

ARMCO STEEL CORPORATION

1122 Curtis Street, Middletown, Ohio • Plants and sales offices from coast to coast
Export: The Armco International Corporation

ARMCO

A Great Asset

Industrialists who attended the annual convention and industrial exposition of the American Society of Tool Engineers in Chicago last week came away with the conviction that it was successful far beyond the most optimistic expectations. In the interest displayed by visitors, as attested not only by the remarkable volume of attendance but also by the close attention given to the technical sessions and to equipment exhibited at the show, the event eclipsed any previous ASTE undertaking and easily ranks as one of the outstanding industrial conventions and exhibitions ever held in this country.

This noteworthy success cannot be attributed to any single factor. Undoubtedly it is the result of a combination of forces that have been accumulating for years. One of these is the increasing recognition of the importance of tool engineering in the American economy which has been mounting steadily, particularly during the past few years. This widespread acceptance of the basic role of tool engineering provides for the annual ASTE exposition a common bond of interest among exhibitors that is stronger than that which binds exhibitors in many contemporary shows.

A second factor is the rather unique make-up of the industry which manufactures the equipment for tool engineering. Here is a group of companies ranging from industrial giants to industrial pygmies, but with a higher proportion of small and medium size companies to large companies than is found in any other important branch of metalworking activity.

This preponderance of smaller companies gives the Tool Show a distinction that is somewhat difficult to explain. One can sense it as he goes from exhibit to exhibit, noting that the exhibit of a small company which specializes in an essential die or fixture may draw more attention than the adjacent display of one of the nation's largest corporations. Perhaps it is this aspect of industrial democracy that gives the Tool Show its own distinctive character.

In this respect, tool engineering demonstrates the important fact that there is abundant opportunity for small companies in metalworking activity. This is one of the great assets of the industrial structure of this nation.

E. L. Shaner

EDITOR-IN-CHIEF

IMPORTS IMPRESSIVE: A striking feature of the Tool Engineers' Show in Chicago last week was the number and variety of European machine tools displayed or demonstrated. They constituted the most impressive array of foreign machines and equipment ever shown in an American industrial exposition.

This predominance of imported models provoked considerable discussion among builders and users. Some expressed concern over the

unprecedented situation whereby importers can offer their machines for prompt delivery at low prices at a time when busy American builders not only cannot promise delivery for a year or more but also are handicapped by numerous government restrictions. Other American industrialists expressed the view that the availability of European machines at this time has some advantage in relieving the pressure on domestic builders and distributors. Some executives think the present situation is temporary and that the return to the competition of a buyers' market would restore the preference of machine tool purchasers for domestic or foreign models to a pattern not appreciably different from that of the pre-Korean period.

One buyer of three European lathes explained his purchase in these words: "These lathes are similar to a certain American model. The price is about $300 lower than that of the American prototype. I can get the foreign machines almost immediately whereas I would have to wait two years for delivery of the domestic machines. I need the lathes now, but if I could get earlier delivery on the American machines I would gladly pay the higher price for them."

BILLIONS NOT SACRED: Whether the $7.9 billion requested by President Truman for foreign assistance is too high or too low is something that Congress should decide after reviewing all of the information available. However the plea of the President and his associates that the figure is sacred and cannot be tampered with without endangering the entire aid program is ridiculous.

When one gets into figures running into the billions, the amount that could be wasted is considerable. Probably $5 billion administered wisely would go farther than $7.9 billion administered poorly. Also Congress should remember that the foreign aid program already has $11.7 billion previously authorized but not yet spent. Congress can afford to be hard boiled in scrutinizing this request for money.

IS THIS NECESSARY? In a recent issue, it was stated on these pages that numerous activities pursued by government agencies are "unneeded and unwanted." In response to this editorial statement an industrialist has sent to this office a copy of a letter received by him from Secretary of Commerce Sawyer. The letter invites the industrialist to assist the Department of Commerce in establishing in the department a "clearing house" for ideas.

The industrialist wonders as to the size of the organization that will be required to run this clearing house and he also wonders to what extent the activity will really assist industry. What do you think?

INTEGRITY OF PROFIT: Earnings statements of representative companies in the metalworking industries generally conform to a standard pattern. Total sales in 1951 were high—in many cases the highest on record, yet net earnings after high taxes were lower than in years when volume was much lower. In fact, United States Steel points out that in spite of its unprecedented sales in 1951, its earnings were no more than they were over a decade ago when capacity and volume were much lower.

Of course, the tax angle is heavily emphasized in comments on net profits for 1951. However this should not blind us to the fact that powerful pressure against profit has been imposed by government intent for many years. The American people face a constant battle to maintain the integrity of profit as a basic part of our economic system.

CAN'T UNDO MISCHIEF: Reports from England indicate that Winston Churchill's Conservative party faces great difficulty in redeeming its campaign pledge to denationalize British iron and steel. At the moment the political hurdles are so high that the Conservatives have decided that they cannot accomplish denationalization in a single move. Instead, when debate comes up in Parliament in April, they will propose a compromise. It probably will provide for a governing board for iron and steel on which labor, ownership and management will be represented. It will have power to fix production quotas and control marketing.

Thus, if this compromise goes through, British iron and steel will be a long way from the freedom the Conservatives envision. The lesson in this is that it is much easier to nationalize an industry than it is to denationalize it.

REDUCED HANDLING

MEANS FASTER PRODUCTION AND LOWER COSTS AT

Firestone

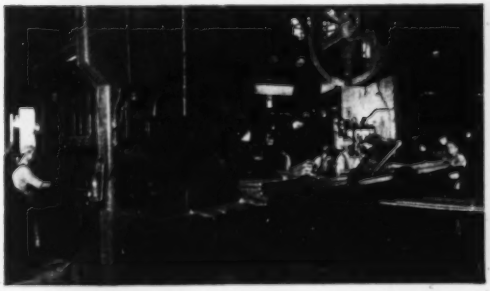
In setting up a Metal Stampings contract, Firestone thoroughly analyzes the manufacturing procedure to reduce every controllable cost factor to its minimum. This includes, of course, the coordination and integration of large multi-operation presses and their faster production methods with heat treating, welding, bonderizing, assembly and finishing.

For complete cost analysis on Stainless Steel, Carbon Steel and Aluminum Stampings and Sub-Assemblies, wire or phone Firestone Steel Products, Metal Stampings Division, Akron 1, Ohio.

Copyright, 1952, Firestone Steel Products Co.

HUGE, HEAVY TONNAGE, LARGE-BED-AREA PRESSES SPEED DRAWING AND FORMING

These operations are integrated with Welding, Heat Treating, Bonderizing, Painting and Assembly in Fast, Straight-Line Production.



Multi-Operation Presses are set up to save time by providing continuous flow of material under constant inspection.

A Word of Caution On Steel Inventories

Care with regard to excess inventories is probably always good business, but when the steel supply begins to approach demand, even if only on one or two items, a word of caution may be in order.

Most steel products are still in short supply. And best opinion indicates that it will be months before supply completely catches up with demand. But the supply is about equaling the demand on the smaller hot rolled and cold rolled bars, though larger sizes are still short. Sheets are also beginning to be more available and our stocks are larger and more complete.

This evidence of availability is offset by government claims for more steel to be required by the defense program. However, as there are definite indications that supply is certainly more nearly approaching demand, it becomes more and more desirable to avoid top heavy and unbalanced inventories. And since the improving supply situation is reflected in warehouse stocks, it becomes safer and more practical to buy steel from warehouse. By thus maintaining a streamlined inventory more capital is available for the operation of your business and the chance of obsolescence and depreciation is minimized.

Unfortunately, our stocks in some lines are still unbalanced from a size standpoint. However, we do advise keeping ahead of the changing situation, ordering the exact kinds and sizes needed from stock, and securing immediate shipment. Our experienced steel men are always ready to counsel with you on matters of procurement, application, and fabrication. So whenever you have a problem or need steel quickly, call Ryerson.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

SHEETS—Hot and cold rolled, many types and coatings

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

STRUCTURALS—Channels, angles, beams, etc.

TUBING—Seamless and welded, mechanical and boiler tubes

BABBIT—Five grades, also Ryertex plastic bearings

PLATES—Many types including Inland 4-Way Safety Plate

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel

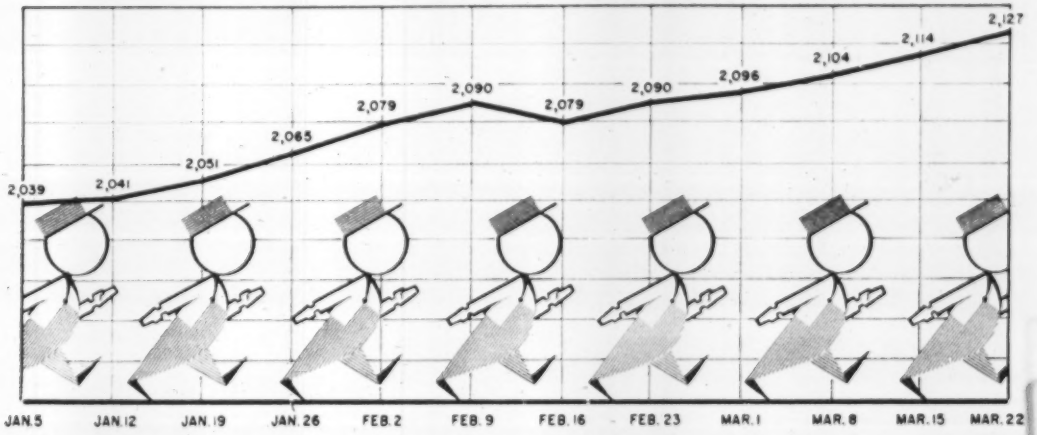
MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Steel Output Up, but Strikes Peril the Stride

(Scheduled weekly output in thousands of net tons for first 12 weeks of 1952)



Source: American Iron & Steel Institute

WSB Muddles the Steel Case

Three months of hearings and deliberations shorten tempers, lengthen odds against a good, long-term solution of the wage and price question

GREAT was the uncertainty in steelmaking centers last week.

Should the mills start shutting down in anticipation of a walkout? Would the union call a strike when the truce extension ended Mar. 23? Or would the United Steelworkers agree to another extension? Was a peaceful settlement of the wage dispute possible under the government's recommendations for a hefty wage increase with no compensating price advance?

These were the questions being asked in steel cities as mill operators, workers and consumers regarded the snafu caused by the administration's handling of the wage case.

Three Months, No Decision—Why, they asked, should such uncertainty exist three months after the dispute had been referred to the government?

Here's what happened. When negotiations between the union and the steelmakers started last November, both parties realized no agreement was possible under existing wage and price controls unless the government took a hand. Shortly before Christmas the case was referred to the Wage Stabilization Board. WSB appointed a special panel to study the case.

Lengthy hearings culminated in a 100-page report on the issues and positions Mar. 14. Recommedations for settlement were to be made by WSB whose members met Mar. 19 to draft settlement recommendations. At the same time, steelmakers were starting to close down facilities just in case.

Exhausted—A 20-hour executive session brought nothing but exhaustion and WSB Chairman Nathan Feinsinger collapsed.

On Mar. 20, United Steelworkers committees met in Washington to consider the board's recommendations and vote on a truce extension. No recommendations were available and union committee meetings were postponed. Meanwhile, time was running out at the steel mills. More facilities were closing down to prevent large-scale damage in event of a strike.

Even the union last week was asking: Settlement or no settlement, what does government intervention get you?

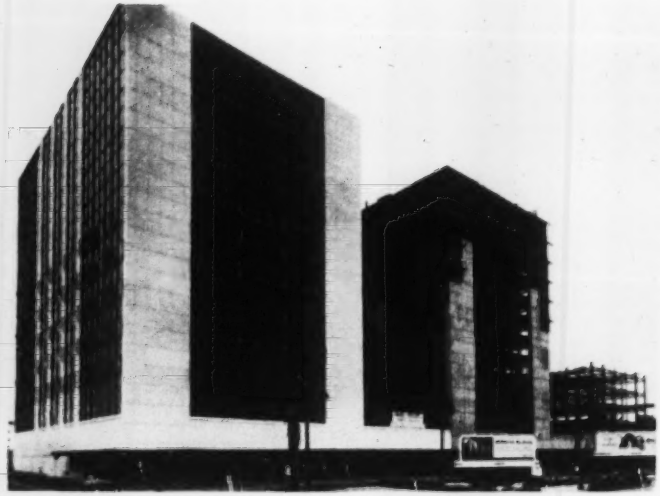
Steel Production Sets New Record

STEEL production in February was higher than ever before in that short month. It totaled 8,645,000 net tons, the American Iron & Steel Institute reports. To attain the new records, the steel industry operated at 100.5 per cent of capacity, highest for any year except 1949.

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated	No. of
1952	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	weekly production (Net tons)	weeks in mos.
*January	8,102,985	100.7	407,298	89.3	625,834	89.7	9,136,117	99.3	2,062,329	4.43
†February	7,688,000	102.2	383,000	89.9	574,000	88.0	8,645,000	100.5	2,088,000	4.14
1951										
February	6,935,512	99.3	326,112	75.6	504,077	87.0	7,765,701	97.1	1,941,425	4.00

Note—The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 137,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons. The percentages of capacity operated in 1951 are calculated on weekly capacities of 1,746,337 net tons open-hearth, 107,806 net tons bessemer, 144,891 net tons electric ingots and steel for castings, total 1,999,034 net tons; based on annual capacities as of Jan. 1, 1951, as follows: Open-hearth 91,054,020 net tons, bessemer 5,621,000 net tons, electric 7,554,630 net tons; total 104,229,650 net tons.

† Preliminary figures, subject to revision. * Revised.



COMMERCIAL CONSTRUCTION FORMS STAIRWAY TO THE SKY
. . . such scenes may become common again if decontrol plans materialize

Construction Curbs Eased—Maybe

If no lengthy steel strike occurs, the construction industry will be decontrolled so that nearly normal operations will be possible by the fourth quarter

STEEL strike or no steel strike, government planners are going ahead with a bit-by-bit decontrol plan.

Commercial and industrial construction will be one of the first segments of the economy to have restrictions substantially eased, partly because the peak in defense building is just about passed. All plans to pare down the controls will go out the window if a steel strike lasts more than a few days; the announcement of relaxations of construction curbs comes now because of lead time considerations for steel and other building materials which must be ordered soon for third quarter construction activity.

More Benign—Defense Production Boss Manly Fleischmann says materials will be made available "for a substantial number of new commercial and industrial starts in the third quarter." If there aren't enough materials available to take care of all the projects in that period, he states, "preference will be given to projects in particular areas which have been especially hard hit by the lack of defense construction and the curtailment of ordinary peacetime building. Projects that don't receive rations of materials for the third quarter will get "advance allotments for the fourth," he says.

The DPA chief thinks things will be "near normal for the construction industry in the fourth quarter," but he refuses to predict whether all controls on that activity will be eliminated by the end of the year. He urges builders to make applications immediately for material and assures them that most projects will get help except those "of a frivolous" nature and strictly recreational or entertainment structures. Nobody knows exactly how many industrial applications are already pending in Washington, but about 1100 requests for material on commercial jobs that would cost some $800 million are on file. Domestic housing production plans remain about the same; 800,000 new starts are planned this year.

Contemplated—Mr. Fleischmann says he is "contemplating" methods of removing controls on certain types of steel and aluminum. Carbon steel, if there's no lengthy strike, may be removed from CMP as early as the fourth quarter this year or the first period of 1953. Exceptions to that would be carbon steel bars, plate, tubing and certain other scarce forms.

Aluminum may be removed from CMP in the first quarter next year. But he says decontrol of aluminum is complicated by the large percentage of military requirements on total supplies of the metal. Under his plan, copper could continue under tight curbs.

Material Outlook Spurs Homes

Private home building increased 13 per cent in February over January in virtually all sections of the country, U. S. Department of Labor says, probably because it became apparent to builders that materials supply is easing.

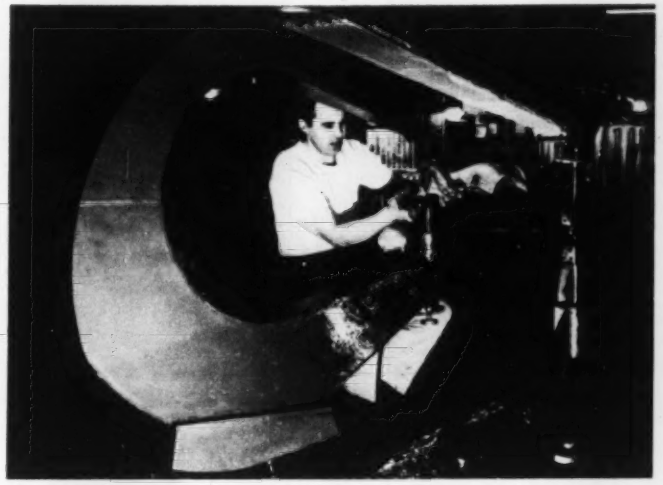
A summary of preliminary telegraphic reports from both urban and rural building-permit officials show a January-February rise of 25 per cent in the number of new units for which building permits were issued, indicating a further strong uptrend of housing starts volume in March.

'Ships Aging,' Cochrane Warns

Block obsolescence threatens U. S. merchant shipping said Vice Adm. E. L. Cochrane, Maritime Administrator, before a meeting of the National Defense Transportation Association. About 2000 active ships are now at sea. More than 700 of these are government owned, 450 of which are Liberty ships. The remaining 1,246 are privately owned vessels now in the middle age of their commercial lives.

Thirty-five Mariners, fast cargo ships, are now under construction and more are needed. Also needed are new tankers, new seagoing ore carriers and new passenger ships.

Urgency stems not only from increased needs of the military, but also from the enormous burden of our export commitments under the economic aid program and a stepped-up flow of strategically vital metallic ores imported into this country.



Portrait of a Steel Nibbler

One of several special tools designed and built by Solar Aircraft Co., San Diego, Calif., this nibbler is used to trim the edges of complicated steel shapes. Solar announced that several British firms ordered such tools as nibblers, automatic inert arc butt-welding equipment, expanders and a variety of others

Metalworking Capacity: Up 8 Per Cent in '52

The industry already has boosted its productive capacity nearly 40 per cent since the end of World War II by the expenditure of about $19.6 billion on plants, equipment

METALWORKING'S fixed physical assets—and the closely related productive capacity—will increase by about 8 per cent in 1952.

That estimate is based on calculations by Machinery & Allied Products Institute. Because of heavy expenditures for new plants and equipment from 1946 through 1951, metalworking already has boosted its productive capacity nearly 40 per cent since the end of World War II.

Capital Only — Metalworking's capital expenditure figures in the table below are based on MAPI estimates and are lower than government figures because they exclude maintenance outlays and cover private industry's domestic spending only. Government figures include some maintenance, foreign and public capital outlays.

On the more limited basis, metalworking's capital expenditures have totaled about $19.6 billion since the end of World War II, some 15 per cent of the $130.1 billion spent by all private enterprises in the period. Although the outlays for metalworking itself are only 15 per cent of the totals, the industry had a hand in the expansion of every category—from farming to lumbering—because it built the machinery that made the expenditures possible. What's more, several categories—notably transportation, coal, gas, oil and public utilities—are closely connected to metalworking.

Change—In 1952 metalworking's capital expenditures will be higher in dollars and in ratio to total outlays than in any other postwar year. Although the Defense Production Administration's certificates of necessity, which allow tax amortization in five years, won't cover all capital spending this year, they will cover most of it. As of Feb. 25, DPA had approved 7188 certificates for total proposed investments of $14.6 billion, much of that to be spent this year. Of that sum, around $6.9 billion, or 47 per cent, is for metalworking expansion.

Iron and steel together account for 19 per cent of the dollar cost of expansion certified through Feb. 25; and if coal, coke, iron ore and other projects auxiliary to the steel program are added, about 25 per cent of all expansions. Aluminum and other nonferrous metals expansions account for 5.5 per cent of the total dollar value certified for rapid tax write-off. When all aluminum projects are completed, they will add 685,000 tons yearly, almost doubling present capacity. DPA already has processed applications relating to copper expansion which are expected to increase the supply of domestic copper by at least 167,500 tons by 1956.

As of Feb. 25, DPA had received 18,700 applications for five-year amortizations. Of that total, the agency had denied 4300 requests and had processed 65 per cent of all cases.

NPA Cautions Diamond Users

Impending crisis in the industrial diamond supply situation is foreseen by Edward W. Greb, director of the Salvage Division, National Production Authority.

In announcing a publication prepared jointly by leading representatives of the industrial diamond industry and NPA on the conservation and salvaging of this vital material, Mr. Greb noted that consumption is approaching another peak while present indications are that supplies will continue to remain at present levels, virtually all from foreign sources.

Metalworking's New Plant, Equipment Expenditures

(IN MILLIONS OF DOLLARS)

	1946	1947	1948	1949	1950	1951	1946-51
Metalworking	$2,931	$3,157	$3,302	$2,493	$2,929	$4,921	$19,733
Primary iron, steel	530	676	816	636	636	1,354	4,648
Primary nonferrous metals	123	216	237	191	171	356	1,294
Fabricated metal products	356	370	343	271	350	430	2,120
Electrical machinery, equipment	282	304	289	216	245	355	1,691
Machinery except electrical	511	519	527	383	411	638	2,989
Motor vehicles, equipment	591	504	474	349	510	797	3,225
Other transportation equipment	109	95	106	87	82	227	706
Stone, clay, glass products	275	368	317	225	321	428	1,934
Instruments, ordnance, other durables	429	473	510	360	524	764	3,060

New ASTE Officers

Meeting informally at Chicago are the new officers of the American Society of Tool Engineers. Left to right: Gerald A. Rogers, assistant secretary-treasurer (sales engineer, Rudel Machinery Co. Ltd., Montreal); Roger F. Waindle, first vice president (partner, Cannon-Muskegon Division, and director of research, Nugent Sand Co. Inc., Muskegon, Mich); Leslie B. Bellamy, president (Detroit manager, Sterling Grinding Wheel Division, Cleveland Quarries); Joseph P. Crosby, second vice president (vice president and sales manager, Lapointe Machine Tool Co., Hudson, Mass.); H. E. Collins, secretary (chief production engineer, Hughes Tool Co., Houston); Dr. Harry B. Osborn Jr., third vice president (technical director, Tocco Division, Ohio Crankshaft Co., Cleveland); Rear: Harry E. Conrad, executive secretary, H. C. McMillen, re-elected treasurer, is not shown

Seen and Heard at the ASTE Exposition & Convention

UNWELCOME VISITOR at the International Amphitheatre halfway through the ASTE Exposition was a $750,000 fire. Hardest hit exhibitor was Eastman Kodak whose optical comparators and similar equipment were ruined beyond salvage. Republic Gage Co., Detroit, could find only one out of 150 thread gages in the debris. International Harvester, Pratt & Whitney, Ercona Corp. (U. S. representative for Carl Ziess Jena), Engis Equipment Co., Bryant Chucking Grinder, Enco Co., Taft-Pierce Mfg. Co., McCaskey Register, Chicago Dial Indicator, Stokerunit and Universal-Cyclops Steel suffered heavy damages. Exhibits were quickly reconstructed. Pangborn Corp. volunteered the use of its cleaning equipment to other exhibitors to repair damaged equipment.

HENRY & WRIGHT will build improved type of Swedish profile grinder using pantograph system mounted on frame of machine. Template is used to guide pantograph in reproducing required contours.

POSITIVE DRIVE of a gear plus smoothness of a belt is provided in a cog belt with teeth that mates with pulleys, shown by L. H. Gilmer Co., Division U. S. Rubber. Can be used for sewing machines, small appliances or with heavy industrial machinery.

MACHINED SKIN CONSTRUCTION, in which frame rib members of aircraft fuselages are machined directly from rolled sheet aluminum, may cut aircraft costs by eliminating thousands of hours of hand labor, says Jesse Daugherty, Giddings & Lewis Machine Tool Co. and Lewis Machine Tool Co.

FURTHER STUDIES of methods of changing the energy of atoms in metals may revolutionize machining methods. Cutting fluids capable of yielding atomic elements could permit major increases in cutting speeds, increase tool life 400 to 800 per cent and increase machineability of "hard to machine" metals, says K. R. Blake, Metalloid Corp., Huntington, Ind.

CONTINUOUS BELT COOLANT FILTERS, dubbed "mechanized milk strainers" by show visitors, were shown by Honan-Crane Corp. and Industrial Filtration Co., both of Lebanon, Ind. Using cloth or paper belts, the filters remove chips, dirt, fine abrasive particles and similar solids from soluble or mineral oil at low cost.

HIGH FREQUENCY furnace melting is being widely used in Europe and much more so than in U. S., reports Dr. Harry Osborn of Tocco and new ASTE 3rd vice president. Applications include bimetals for lawn mower blades, tool steels and continuous casting of cast iron pipe.

TREPANNING, a cutting process used by the early Egyptians for brain surgery, helps tool engineers in the faster production of accurate gun barrels and other products requiring removal of substantial quantities of metal to form deep holes, reports Fred W. Lucht, Carboloy Department, General Electric.

KELSEY-HAYES WHEEL CO. at Detroit and McKeesport, Pa., has automatic setup for assembling auto wheel rims and disks. First operation: 12 holes are punched simultaneously. Second and third: Automatic rivet sticker inserts 12 rivets simultaneously; then all rivets are headed at once. Fred Sharpe at K-H designed the equipment using Hannifin hydraulic riveters.

NEWEST THING in assembly work is use of multiple nut runners. Ford uses 2-spindle Ingersoll-Rand air-operated machine in assembling main bearing caps on 6-cylinder engines at Cleveland. Ford, Chevrolet and Oldsmobile tighten five wheel nuts simultaneously. Ford is planning cylinder head job involving 21-27 nuts. Output: 3 to 20 times faster.

Tool Engineers' Show

One big problem pointed up: How to keep production in a civilian-military dichotomy

THIRTY-FIVE THOUSAND metalworking production planners thronged Chicago's International Amphitheatre Mar. 17-21 seeking help on the myriad technical problems in maintaining a guns and butter economy. The occasion was the American Society of Tool Engineers' Industrial Exposition.

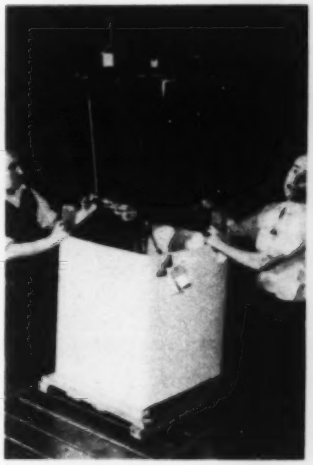
More than 400 exhibitors showed their latest developments in machine accessories designed to reduce manual effort and increase production: Cutting tools, grinding equipment, presses, machine tools and instruments, gages and other precision control apparatus.

Size Doesn't Count — Only a handful of exhibitors could be classified as really large firms.

Convention hall and hotel room talk pointed up the problems of the tool engineer in maintaining a dual economy, where one line may be producing military goods while a parallel line continues to turn out a civilian product. Production problems, say the tool engineers, are much greater than during World War II.

Controversy—Hottest conversation at the show centered around the exhibits of foreign-built machine tools. Scores of British, French, Swiss, Belgian, Italian and German machine tool builders were represented in importers' exhibits.

American machine tool builders' representatives, many of whom are restricted in showing at industrial exhibits and most of whom cannot promise delivery for many months, are bitterly critical of the situation which permits foreign builders to edge into the domestic market. They reason thus: We are taxed to raise funds for foreign aid; part of these funds go for the establishment or rebuilding of foreign tool plants; now the foreign builders are offering tools for quick delivery and often at lower prices. Where, they ask, is justice? Foreign exhibits occupied a substantial share of the space at the show and all the importers were doing a brisk business in foreign tools.



APPLIANCES OUTPUT DOWN
. . . aggressive selling an answer

Sluggish Appliances

Refrigerators, stoves and washers still need to be pushed uphill by stronger selling efforts

NOTHING'S WRONG with the market for home appliances that aggressive selling can't cure.

That's what stove, refrigerator and washer makers are saying and it's borne out in fact, partially at least.

One refrigerator manufacturer whose sales dipped only half of the 35 per cent average for the industry in 1951, credits aggressive merchandising for the good showing. An electric range maker held itself to a 20 per cent decline in sales from January, 1950, to January, 1951 — while the industry reports a 40 per cent drop — "by sheer weight of selling."

Unanimity at Last — All concerned, manufacturers, distributors and retailers, agree sales of large home appliances are not moving well or easily. Looked-for strengthening in the market has not materialized. Customers have become a bigger problem than controlled materials.

Few manufacturers are pushing for extra allotments, some are not using all they can get. Exceptions to that rule are aluminum and nickel. One refrigerator maker reports it is producing to the limit of its copper supply and another notes a tight supply of cold-finished steel bars. Little plastic has been added to 1952 models of large appliances, partly because there is no great need to substitute and partly because there is some resistance to plastic knobs and handles in place of shiny, metal ones.

New, All New—To tempt prospective customers, refrigerator makers are bringing out "hot" new features (refrigerators sold slowest, ranges sold fairly well, and automatic washers very well in 1951), such as two separate cold zones and automatic defrosting. Perfection Stove Co., Cleveland, is bringing out a complete new line of electric ranges with nine models.

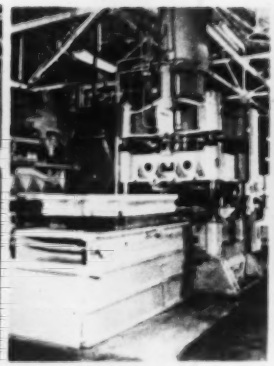
Added to the traditional inducement of model changes are price reductions ranging from $10 to $55 on high price models. Even where list price remains the same or rises slightly, special promotions and deals bring the net prices generally below last year's prices for this period. Automatic washers are the exception here and are holding their yearend levels.

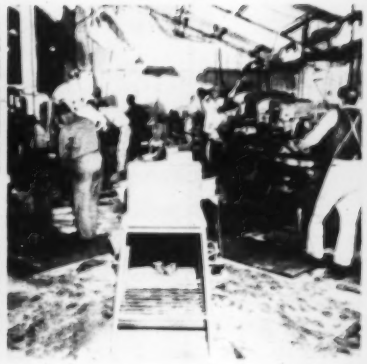
Whooping It Up—Promotional programs have been unusually heavy with offers of a year's free supply of soap powder with each washer bought, "long" trade-in values and special refund days — one day each month when all buyers of appliances from a local chain in Detroit get their money back and their merchandise free.

Distributors say their inventories are low to average. Certainly they have been worked down from last year's levels and there is general confidence that 1951 models which remain on hand can be moved. But, high inventories, if there are any, occur up to this point in the supply pipeline. Retailers are holding inventories way down. Some are buying only to replace goods which have been moved from their floors.

Psychoanalysis—What the manufacturers, distributors and retailers would really like to know is why, with the large amount of currency presently in circulation, does Mrs. Housewife wait instead of buy?

Partial answers are seasonal influences for the beginning of the year, income tax payments coming due, uncertainty over steel and coal strikes, and reaction to post-Korea





Luscombe Plant Gets Temco Tempo

When Texas Engineering & Mfg. Co. Inc. acquired control of Luscombe Airplane Corp. two years ago, it began an improvement program at the Garland, Tex., plant. At left are furnaces used in process operations on Convair B-36 parts which the company makes. The press, center, has a capacity of 726 tons and a 44 x 54 inch bed. The milling machine shop, right, is laid out in a space-saving diagonal arrangement allowing maximum working area

scare buying of a year or more ago.

More comprehensive explanation is that Mrs. Housewife is just reacting to "scare selling" which appliance people brought on themselves when they expected to sell with a minimum of postwar effort and didn't. Now, Mrs. Housewife is sitting back and waiting to see just how good a deal she can get.

In any event, appliance makers and dealers are hitching up their belts to do an old-fashioned selling job plenty of smiles, repeated call backs and more actual sale-closing procedures many old hands have forgotten and new ones never learned.

More Galvanized Sheets

Galvanized steel sheets are inching out of the realm of hard-to-get products.

Output during March should total between 165,000 and 170,000 tons, and during April it should move up to 200,000 tons and continue at least that large over succeeding months. That's the outlook by the National Production Authority.

A few months ago, production was between 156,000 and 159,000 tons a month.

The improvement stems from a loosening in the supply of zinc, and more generous allocations of zinc by the government.

Another result should be an improvement in the supply of galvanized pipe.

Supply of steel for coating will pose no obstacle because of the softening of demand for cold-rolled sheets.

There is one factor of uncertainty in connection with the April zinc allocations for galvanizing. Included in the allocations for galvanizing is an "appreciable" quantity of special high-grade zinc. Production of a minimum of 200,000 tons of galvanized sheets in April hinges on use of this special high-grade zinc by the galvanizers. Steel companies complain that it costs more than prime western, which would up the cost of galvanizing.

Super-Weapons May Alter U.S. Procurement

BIG INCREASES in subcontracts for new super-weapons may be coming along sooner than supposed. The military is "in a true ferment" as it switches to super-power weapons for new methods of warfare, says Defense Secretary Robert A. Lovett. Already substantial contracts have been awarded to aircraft manufacturers to study nuclear power. Boeing Airplane Co., for example, will work with Pratt & Whitney on engineering problems of atomic powered planes.

But contractors may soon find that the new warfare methods will alter many aspects of the defense procurement program. Mr. Lovett says that advances in applied sciences and technology are bringing increasing shifts from piston engines to jets, from visual devices to radar, piloted aircraft to guided missiles and certain types of artillery to rockets.

If lack of sufficient defense contracts is one of your procurement problems, check over the table at the bottom of the page. It's a selection from the latest contracts valued at $100,000 and over awarded to metalworking companies by government procurement agencies.

PRODUCT	CONTRACTOR
Gear Shavers	National Broach & Machine Co., Detroit
Gage & Weight Machines	Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Distillation Units	Mechanical Equipment Co. Inc., New Orleans
Machines	Standard-Knapp Div., Hartford-Empire Co., Portland, Conn.
Diesel Locomotives	Baldwin-Lima-Hamilton Corp., Philadelphia
Centrifugal Pumps	Renown Stove Co., Owosso, Mich.
Aircraft Pumps	Thompson Products Inc., Cleveland
Aircraft Engine Parts	Pratt & Whitney Div., United Aircraft Corp., E. Hartford, Conn.
	Hamilton Standard Div., United Aircraft Corp., E. Hartford, Conn.
Shells, 90 mm	National Tube Div., U. S. Steel Co., Pittsburgh
Heads for Rockets	National Tube Div., U. S. Steel Co., Pittsburgh
Parts for Grenade Launchers	Sun Ray Photo Co., New York
Primers	Automatic Machine Products Co., Attleboro, Mass.
Cartridge Cases	Fedders-Quigan Corp., Buffalo, N. Y.
Hand Grenades	Fibre Forming Corp., Olean, N. Y.
Parts for Pistols, cal. 45	Colt's Mfg. Co., Hartford, Conn.
Pantoons	Beatrice Steel Tank Mfg. Co., S. Beatrice, Nebr.
Electric Ranges	Crown Stove Works, Cicero, Ill.
Generators	Westinghouse Electric Corp., Pittsburgh
Parts for Electrical Equipment	Hotpoint Inc., Chicago
Electrosurgical units	Liebel-Flarsheim Co., Cincinnati
Fans	Emerson Electric Mfg. Co., St. Louis

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

FERROALLOYS—Amendment of Mar. 12, 1952, of NPA Order M-80 changes the method of handling requests for allocations of nickel anodes, salts, chemicals, oxides and catalysts, and allocations of ceramic grades of cobalt, eliminating considerable paper work for thousands of users. The amendment was effective Mar. 12, 1952.

CANS—Amendment of Mar. 13, 1952 of NPA Order M-25 authorizes allotment without charge to quotas, of secondary tin mill products to can manufacturers. For the rest of the first quarter, 35,000 tons are allotted, and for the second quarter, 68,000 tons. The amendment was effective Mar. 13.

INDUSTRIAL DIAMONDS — NPA Order M-102, issued Mar. 13, 1952, and made effective that date, extends NPA control over distribution of crushing bort and diamond powder, the types of industrial diamonds now in shortest supply. Two principal features of the order are: A mandatory monthly reporting procedure, and a section providing for distribution of crushing bort and diamond powder under NPA supervision through the discretionary use of directives.

CADMIUM—Amendment of Mar. 13, 1952, of NPA Order M-19 relaxes use controls on cadmium. Inventory controls of M-19 are retained. The amendment was effective Mar. 13.

GRINDING WHEELS—NPA Order M-103, issued Mar. 13, 1952, and made effective that date, puts restrictions on users and manufacturers of diamond grinding wheels to conserve diamond crushing bort and to contribute to an equitable distribution of such wheels. Main features of the order are: It limits inventories of any size or grade of diamond grinding wheels to 60 days, beginning May 13, 1952. It requires users to confine themselves to use of the most durable type of diamond grinding wheel for grinding certain types of carbide tools. It limits the diamond (bort) content and depth of diamond (bort) bearing surface that a manufacturer may produce. M-103 was effective Mar. 13.

PASSENGER CARS—NPA Order M-68, which was to conserve metals in the automobile industry, was revoked Mar. 14, 1952. Conservation measures in M-68 will be generally continued through CMP allotments.

Appointments in Washington

David T. Marvel, Olin Industries, was made deputy assistant administrator, National Production Authority. Mr. Marvel is principal assistant to Walter H. Wiewal, assistant administrator in charge of the Metals & Minerals Bureau.

Richard A. McDonald, chairman of the executive committee, Crown-Zellerbach Corp., was appointed assistant administrator, in charge of the Industrial & Agricultural Equipment Bureau.

Charles J. Haring of J. D. Adams Mfg. Co., was appointed director of Construction Machinery Division, National Production Authority. Deputy director is John W. Mohler of Caterpillar Tractor Co. James Tiller, Galion Iron Works was appointed chief, Motor Graders & Off-Highway Equipment Branch, Construction Machinery Division.

M. B. Elliott, of General Electric Co., was appointed chief, Outside Distribution Branch, Electric Equipment Division, National Production Authority.

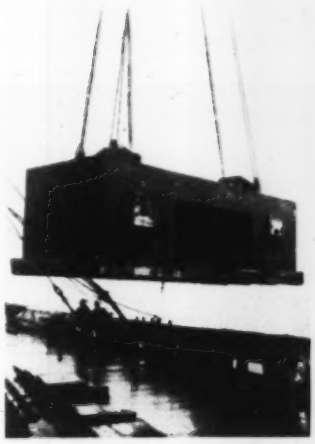
H. I. Mackey, of Diamond Chain Co., Inc., was appointed chief, Mechanical Power Branch, General Components Division, National Production Authority.

Lincoln Love, of Ford Motor Co., was appointed deputy director, Metalworking Equipment Division, National Production Authority.

S. D. Baker, of J. I. Case Co., was appointed chief, Tillage Tools Branch, Agricultural Machinery Division, National Production Authority.

Richard Creter, Continental Motors Corp., was appointed chief, Engine Branch, Motor Vehicles Division, National Production Authority.

Frank A. Koziel, of E. Ingraham Co., was appointed chief, Program & Requirements Branch, General Industrial Equipment Division, National Production Authority.



Press Heads for France

More American-made materiel heads for Europe as this 100,000-pound press crown is loaded aboard the French Line freighter *Troain*. It is one of two large presses sent to Automobile Peugot of Paris, where it will stamp out automobile body parts. The 1000-ton capacity machine was made for export by E. W. Bliss Co., Canton, O.

SSB Slowly Shoveling Out

Salary Stabilization Board has finally disposed of more than 10,000 applications for adjustments in salary or other compensation since the beginning of the year. In addition, more than 1500 interpretations in individual cases have been issued and about 500 individual letters have been answered since Jan. 1, 1952.

As of Jan. 4, 1952, there was a backlog of 11,100 salary cases. This has been reduced to less than 5400 applications and 1000 new plant reports.

WSB Grants Two Wage Increases

Decisions of the Wage Stabilization Board will increase the pay of some 36,000 AFL teamsters in 11 Central states and many of the 3 million construction workers in the nation.

The WSB agreement for the over-the-road truck drivers grants a 19-cent hourly pay boost and calls for six paid holidays, a dollar-a-week increase in cost of health and welfare benefits and other fringe inprovements.

The board said it will approve wage increases up to 15 cents an hour this year for the construction workers. This is above the allowable 10 per cent increase over area rates prevailing on July 1, 1950. Such added raises must have prior board approval.

Heavy Castings Needs Queried

Government financing of facilities may be asked by Steel Castings (carbon and low alloy) Industry Advisory Committee. Orders for the production of extremely heavy castings for certain new types of heavy presses may require the addition of new facilities which are not capable of varied use.

Further information on the tonnage of metals needed in the heavy press program will be sought by a task group appointed by NPA. Substantial tonnages of the castings which the industry will be asked to produce are to be used for pressing aluminum forgings in the aircraft program. Even greater tonnages of castings will be needed during the next few years for other programs.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Formation of Machine Tool Commission is imminent. Clay Bedford outlines steps on the agenda, explains new priority system, seeks green light for heavy presses

PLANS for the creation of a Machine Tool Commission (or Industrial Equipment Commission) in the Office of Defense Mobilization are being developed intensively and the new commission should be announced shortly.

That conclusion can be drawn from testimony by Clay P. Bedford, author of the commission idea, before the Moody Subcommittee on Mobilization and Procurement, Senate Small Business Committee, last week.

Irons in the Fire—Mr. Bedford said 27 individual steps already are on the agenda of the proposed commission. Those he mentioned:

1. Recruitment of more informed personnel from the machine tool industry to review the machine tools on hand and determine deficiencies.

2. Organization of a better management system for the machine tool pool.

3. Establishment of a real priority system so that defense contractors, instead of getting merely a hunting license, will receive real help in obtaining needed tools.

4. Separation of "the wheat from the chaff" in critical machine tool programs to furnish the really vital tools first.

5. Framing of a long-range program to insure a broader defense production base which will be ready to serve all needs in a possible future war.

Similarity—Discussing the proposed priority system, Mr. Bedford said it would be something on the lines of the E-1-b list of World War II in which a machine tool builder's monthly shipments were apportioned on a percentage basis over a predetermined list of user areas. "We hope the system that will be evolved will be self-policing at industry level," he said.

In the meantime, said Mr. Bedford, a short-cut method has been applied for reducing the time for getting needed components into the hands of contractors and subs. Under new procedure the contractor or the sub or the sub-sub can go directly to the NPA industry division instead of up the contracting ladder.

Start Now—Asked about current uncertainty over Air Force construction of a 75,000-ton press, Mr. Bedford replied: "We should go ahead and make one of these presses. It takes a long time to find out what you can do with such equipment—so let's start now and be ready in five years for what may happen then."

Author Meets Critic

NO DECONTROL recommendations are expected in the near future from the recently created OPS Committee to Study Price Decontrol. Outside impression is that the purpose of the committee, at least right now, is to prepare answers to critics of price control. According to the chairman, Edward F. Phelps Jr., OPS assistant director, the committee "is in the process of preparing a continuing agenda which will allow it to develop recommendations for action or inaction to the director of price stabilization and to the administrator of the Economic Stabilization Agency."

Court Right Restricted . . .

A bill to add further difficulties for companies and business groups brought into litigation under the antitrust laws and in treble damage suits is H. R. 6157, introduced by Rep. Emanuel Celler and now before the House Judiciary Committee. It would prevent a defendant company from obtaining a change of venue without consent of the Federal Trade Commission. Defendants now are able to obtain a change of venue when they can show that it will reduce costs of obtaining testimony of necessary witnesses and expedite trial by getting the case into a less congested court.

Empire Builder Touchy . . .

Another of the periodical government attacks against the freedom of advertising may be in the making. That inference is to be drawn from remarks by Interior Secretary Oscar L. Chapman, who is growing touchy because of the desperate fight private power interests are waging to curb the ever-growing federal power empire. He complains especially about full-page advertisements in which the private companies denounce the trend toward socialism in the power field.

Says Mr. Chapman: "The cost of those ads is mostly paid for by taxpayers, because the costs of such advertising are deductible for income tax purposes."

In Washington, today's proposal often becomes tomorrow's new statute. So it will not cause surprise if some congressman on the Fair Deal side soon introduces a bill to effect federal control of advertising by defining the types of advertising messages whose cost may be deducted in income tax.

Add One Part Alcohol . . .

Another possible objection to the promotion of motor fuel consisting of alcohol mixed with gasoline has been disproved in tests by Armour Research Foundation for the Department of Agriculture.

The question: Will alcohol, either injected into the manifold or used as a blend with gasoline, have a detrimental effect on additives (antioxidants or corrosion inhibitors) in the premium grades of lubricating oil recommended for use in most passenger automobiles?

In the test, a standard Chevrolet engine was operated first on straight gasoline and subsequently on a mixture of 1 part water, 1 part alcohol and 8 parts gasoline. With the latter fuel, average loss of weight of the bearings was found to be below normal.

Cut Tubing?

NEW DUNCAN-McKAY TUBE CUTOFF IS YOUR ANSWER . . .

CHECK THESE OUTSTANDING FEATURES

√ SIMPLICITY OF DESIGN	With economy in mind.
√ SIMPLICITY OF SET UP	Ordinary shop personnel entirely competent after brief instruction.
√ SIMPLICITY OF OPERATION	Fully automatic—fool-proof.
√ SPEED OF OPERATION	Rates as high as 60 cuts-per-minute, depending on length of cut tube.
√ NO LOSS OF METAL	Tube wall is sheared—no metal removed.
√ QUALITY OF CUT	Practically burr free.
√ TUBE STATIONARY DURING CUT	Eliminating chances of marking.
√ CONCENTRICITY OF TUBE	Original concentricity maintained.
√ LENGTH TOLERANCE	Positive stops control travel of feed cylinder—close length tolerances easily maintained.
√ TOOLING	Simple, concentric dies—easily produced in your own tool room.
√ LOW MAINTENANCE	Early models have been in continuous operation—over 2,000,000 cuts with only occasional die grinding required.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

where power is part of the product,

you're right with a

DELCO

When you need motors—to serve as a *part* of your product or to help you *make* your product—look to Delco for the motors that will serve you best.

Delco produces motors for practically every known purpose . . . and each Delco motor is *engineered* for the kind of work it has to do. It's made of the finest materials, and constructed to stand up longer under the roughest conditions.

So check on Delco. You'll find Delco motors fit your needs, and that Delco always delivers on time. For complete details, write to Delco Products, Dayton, Ohio, or call the nearest sales office listed below.

DELCO PRODUCTS

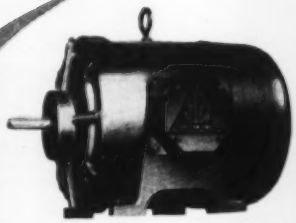
Division of General Motors Corporation

Dayton, Ohio

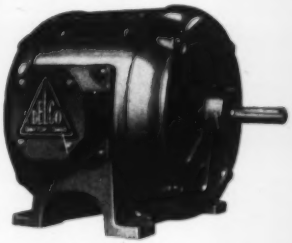
DELCO DAYTON OHIO

SALES OFFICES:

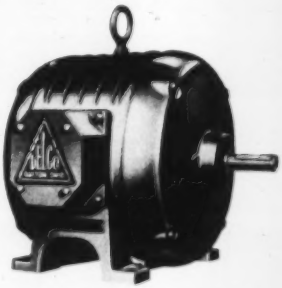
ATLANTA • CHICAGO • CINCINNATI • CLEVELAND
DALLAS • DETROIT • HARTFORD • PHILADELPHIA
ST. LOUIS • SAN FRANCISCO



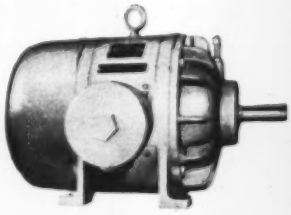
TOTALLY ENCLOSED FAN-COOLED MOTOR



OPEN BALL-BEARING MOTOR



TOTALLY ENCLOSED MOTOR



EXPLOSION-RESISTANT MOTOR

DELCO FEATURES MAKE DELCO FINEST

Freedom for British Steel: How Much?

Conservatives, trying to redeem their compaign pledge to denationalize the British iron and steel industry, are ready to compromise on less than full private control

DENATIONALIZATION of the British iron and steel industry, though still a prime goal of the Conservative party, will not come up in Parliament until April at least. Even then, Conservatives will probably propose something less than a freely competitive system for iron and steel making such as that which exists in the United States.

Reason: Laborites threaten to re-nationalize the industry whenever they return to power. And they say they'll only pay what the government paid for the shares when it took them over originally in 1951.

Three Way Split—To placate the Laborites and give some assurance to private capital that it won't be investing in a losing, fly-by-night cause, the Conservatives are writing a 'middling denationalization bill.

This new bill will provide for an Iron & Steel Board on which labor, ownership and management will have representation. The board will have the power to fix production quotas and control marketing.

Thus, private capital will own approximately 75 per cent of the stock, but there will be no sectional competition. Just a new kind of monopoly.

In the Meantime—Conservatives are determined nevertheless to hold the line at the present stage of nationalization. Duncan Sandys, Minister of Supply, has told the present Iron & Steel Corp. to keep hands off the industry and individual companies whose securities it holds until further notice. The government-owned corporation recently got a new board chairman after Steven J. L. Hardie quit over a dispute with Conservative policy makers.

The new chairman, who is Sir John Green, will be charged with treading water until the current monetary crisis is eased and routine financial business is completed as the fiscal year ends on Mar. 31.

Wide World

CHAIRMAN SIR JOHN GREEN
. . . a short term engagement

French Car Output Rolling

The French automobile industry for the first time doubled the 1938 monthly average production of cars in January, 1952. There are signs though that production has reached a ceiling which it will be difficult to surpass. Exports especially have dropped since last fall due to the revival of German competition and rising prices.

Production	1938*	1951*	1952 January
Passenger Cars	15,200	26,160	31,940
Commercial Vehicles	3,750	11,040	12,910
Exports			
Passenger Cars	1,610	7,880	6,810
Commercial Vehicles	370	2,560	2,160

*Monthly Average

Perambulatory Tool Makers

Many leading East German machine tool builders have escaped into the Western zone during the past two years and are already operating new plants, says Kurt Orban, president of Kurt Orban Co. Inc., large machine tool importers. About 40 per cent of their production is scheduled for delivery to the United States, beginning in June.

There is also a steady exodus of the companies' former employees from East Germany, who follow the owners at the risk of being caught and shot as "economic saboteurs," he adds. Yet 200 employees of one manufacturer alone crossed over during the last four months.

Disassembled West German plants are bouncing back, too. A. G. Scheiss started with only a few drawings left from a plant formerly employing 5000 workers. A new plant now employs 1900 persons and is making turret lathes, boring mills and special equipment.

American importers are facing keen competition from the British, who offer 50 per cent cash down payment for German tools. The Germans, however, prefer selling to the U. S. to develop markets here to replace those of the now Iron Curtain countries, who took about 40 per cent of Germany's pre-World War II tools production.

Two Nations Standardize Orders

An agreement standardizing procedures for U. S. procurement of military supplies in Canada has been signed by representatives of the two nations, announces the Defense Department. Contracts awarded by the U. S. military departments in Canada will generally be placed with the Canadian Commercial Corp. This corporation is a government-owned agency which deals with the sale of military stores to other governments.

The agreement also contains provisions relating to profit limitations and use by each country of the other's materials inspection services.

St. Lawrence Seaway: A Bargain

The long debated St. Lawrence Seaway appears to have little chance of U. S. support as Congress questions its economic feasibility. Total cost of the project to the U. S.: $566,794,000.

For this, the U. S. would get revenue on what is estimated by one source as a 45-million-tons-a-year market plus the U. S. share of electric power equalling 6.3 billion kilowatt hours a year. It is estimated that the combined revenue would cover the operating cost and at the same time pay off the entire investment in 50 years.

Motorola Streamlines Chassis

Motorola Inc. is producing a new, simplified radio receiver which uses only 14 standard tubes of five types as compared with the 16 or 17 tubes used by previous models. Manufactured at the company's communications and electronics division in Chicago, the components and wiring of the set are designed so that all terminals and service points are fully accessible. Made for use with two-way mobile systems, its parts are interchangeable with present models

Sales for Hire

More metalworking manufacturers are finding agents the answer to their sales problems

ON THE INCREASE is the manufacturers' agent—industry's combination salesman, executive, expeditor, engineer, wet-nurse and bird-dog.

At present approximately 5000 agents or firms are selling metalworking products on a contingency basis, compared with about 4100 in 1948 and 3500 in 1939. It's estimated that these agents handle sales amounting to $3 or $4 billion annually.

Raison D'etre—Use of agents is usually a question of economics. The manufacturer has no overhead expenses and avoids special taxes and involved paper work which some states impose on out-of-state companies. The only expense is the agent's percentage, usually five per cent, and the only concern is increasing sales. Commissions may vary from the five per cent standard. Where sales are non-repetitive, tool and die work for example, the commission may be as high as 10 per cent and where volume is very high it may well be less than five per cent.

Looking to manufacturers' agents are a great many metalworking firms. Most are small to medium plants who cannot afford at the outset to maintain their own sales branches. Detroit, where the automotive industry deals with many small firms and requires a wide variety of materials and parts, supports 550 to 800 agents.

There are some signs, though, that larger firms are using manufacturers' agents increasingly to bring out new product lines or open sales territories with unknown market potential.

By selecting the right agent, manufacturers find that they have ready-made contacts with just the firms in which they are interested, eliminating a lot of spade work. To make for profitable and efficient operations, most manufacturers' agents choose their "principals" for the complementary nature of their respective products.

Procurement Poser — Military procurement has posed some difficult problems for the manufacturers' agent. Some procurement officials have refused to allow the payment of the agent's commission by the principal when he has brought in military business. Many companies selling exclusively through an agent or agents who have protected territory arrangements are wondering as to the correctness of having this kind of sales representation when dealing with the government.

Recognizing this problem, the House Small Business subcommittee has urged defense agencies to accept manufacturers' agents as they would other salesmen seeking military business, not to lump all together as "five-percenters" in its presently sinister connotation.

New York City has a tax law which requires an agent operating there not only to pay tax on what he himself sells but report the amount of business done by the principal manufacturer with customers in New York City. That law is being fought by the Manufacturers' Agents National Association which was organized in Alhambra, Calif., in 1947, and now has chapters in 13 cities across the country.

Transporter Knudson Tries Again

Transportation, warehousing and port utilization facilities needed for third quarter 1952 have been forwarded to the Defense Production Administration by Defense Transport Administrator James K. Knudson. His request for rail, street and waterways equipment are at substantially the same level requested for the second quarter but pared by DPA. Among them: 32,250 freight cars, 975 locomotives, 450,000 net tons of new rail, 1.1 million passenger cars, 275,000 trucks, 96,000 truck bodies, 300 barges and towboats and $539 million worth of automotive replacement parts.

"Construction in these fields is not necessarily expansion but is primarily needed to improve efficiency and relieve spot shortages. The allotment of materials for the program is necessary if the defense and civilian transportation facilities of the nation are to be properly maintained," Administrator Knudson says.

Smooth Going for Files

The ancient tool is still performing well, but with modern twists from the power-driven rotaries

ONE OF man's oldest metalworking tools, the file, is still functioning smoothly — although with a few modern twists.

The file was known in Biblical times for it's mentioned in the Old Testament, but evidently only one or two types were common then, while some 6000 designs, sizes, shapes and cutting combinations are used today, most as variations of the industrial and mill type, the Swiss pattern or the power-operated rotary designs.

Up-to-Date—The modern twist is provided by the power-driven rotaries which have been in existence for some time but which have gained their greatest acceptance during and since the end of World War II. One manufacturer says its sales of that type of file in 1951 were 80 per cent ahead of the 1948 pace—which itself was a good year.

For some months steel supplies have been no problem to file-makers, partly because the 35 companies in the industry—six of them accounting for most of the business—use only about 25,000 tons of high carbon steel annually in the form of bar stock. Rotary files also require tungsten carbide and high speed steel.

Calm and Steady—Demand for files—most of which are distributed by mill supply houses and hardware tool wholesalers — has held fairly steady in the past few months. Hardware wholesalers bought heavily about a year ago in fear of a shortage. But the predicted scarcities didn't develop and for a while last year customers were serviced largely from dealer stocks. Since last autumn inventories have been reduced to normal and new buying has been average.

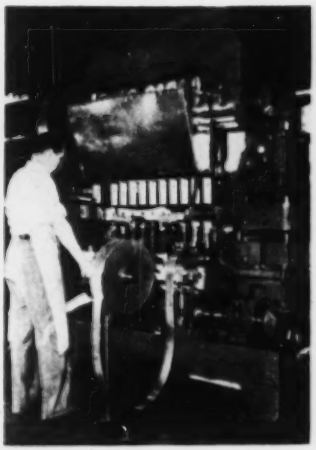
Because of its distribution methods, the file industry doesn't know how much of its output goes for direct defense purposes, but it's probably not large. The rotary files find the greatest defense use, notably in aircraft engine manufacture. But defense or no defense, the ancient file is still the most ubiquitous of all tools—found everywhere from basement workshop to industrial tool room.

Too Much Electronics Red Tape

Some manufacturers of components for electronic equipment are giving more prompt deliveries on unrated orders, the Electronic Parts and Components Distributors Advisory Committee reported at a meeting with the NPA. The committee said that rating an order to these manufacturers slows up delivery as much as a month. The distributors say the manufacturers do not want rated orders because they require too much paper work.

A general easing of the electronic supply situation was attributed by the committee to decreasing demands for television set production.

However, supplies of test equipment, connectors, relays, panel instruments, soldering iron tips and products containing nickel, tungsten and cobalt are still reported by the committee to be in short supply.



Precision Pattern Puncher

When it completed a new warehouse and installed a variety of automatic presses and toolroom jig-boring and jig grinding equipment, John Volkert Metal Stampings Inc., Queens Village, L. I., N. Y., increased its capacity by 20 per cent. This new ten-plunger eyelet machine is tooled to produce an intricate defense item. Volkert supplies stampings and assemblies to electrical and electronic industries

West Coast Airplane Makers Stress Conservation

WEST COAST airplane makers are finding it easier to conserve critical materials now than in World War II. For one thing, they have a permanent organization now to mastermind the job.

The Conservation Panel of the Manufacturing Methods Committee, Aircraft Industries Association, concerns itself with the saving of critical materials and chemicals and studies training programs, extension of tool life and various other manufacturing methods. Information is exchanged, via the committee, between major aircraft manufacturers and subcontractors.

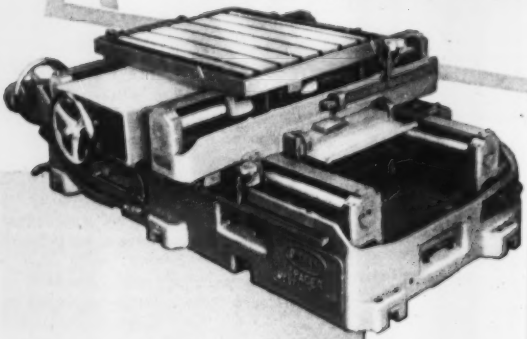
Saving Ideas—This group reports that physical effort required to effect conservation programs within eight West Coast aircraft plants now only amounts to two-tenths of that required by similar programs during World War II. Over 10 per cent of employee suggestions have been along conservation lines.

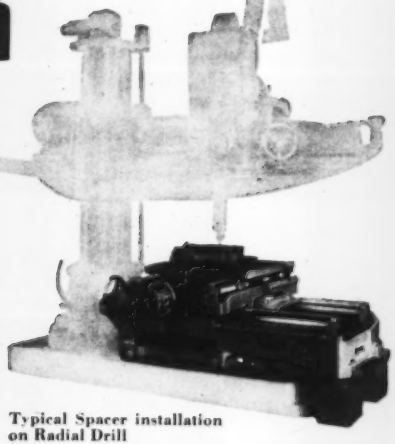
In co-operation with the American Iron & Steel Institute scrap drive, eight West Coast airframe makers, members of the committee, reported collections of 300 tons per month of dormant steel scrap. Other savings include a half-million dollars worth annually of chromic acids, by use of a cation exchange process to separate pure chromic acids from process contaminated solutions, and thousands of pounds of high-grade zinc die metal, accomplished by reduction of die storage.

Counting Up—In addition, the committee estimates that its conservation program is helping to save $30 million annually in production costs at 15 West Coast aircraft plants.

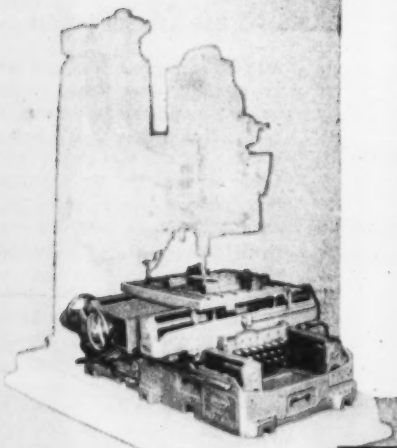
Currently, the Aircraft Production Resources Agency and representatives of the military are working with the methods committee of the AIA on a plan to substitute aircraft quality boron-treated steels for several alloys presently in use.

EVOLUTION.....
FIRST JIGS *then*
BULLARD SPACER





Typical Spacer installation on Radial Drill



For Higher Degrees of Accuracy, the Spacer is installed on Cincinnati Super Service fixed arm Drill

Jigs and templates are the old original means of repetitive production of a pattern of accurately spaced holes.

Today, through Evolution and Engineering Skill, Bullard has developed a FASTER, more Accurate and LESS COSTLY Method for this type of work.

Interchangeability of parts in small quantities at minimum cost is most important in modern manufacturing.

NO TIME REQUIRED FOR: —

Jig Design — Jig Handling

Jig Processing — Jig Storing

NO OPERATOR FATIGUE in locating and relocating of Drill Arm. See further comparisons in Spacer catalog.

When writing, mention "EVOLUTION".

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Automakers' Dollar Sales Are Up, Earnings Are Down

	General Motors		Chrysler		Studebaker	
	1951	1950	1951	1950	1951	1950
Total Sales	$7,464,000,000	$7,531,000,000	$2,547,000,000	$2,191,000,000	$583,000,000	$477,000,000
Defense Sales	761,000,000	289,000,000	76,000,000	N. A.*	40,000,000†	N. A.*
Net Earnings	$86,000,000	$34,000,000	72,000,000	128,000,000	12,400,000	22,500,000
Earnings Per Share	$5.63	$9.35	$8.27	$14.69	$5.35	$9.55
Earnings as Per Cent of Sales	6.8	11.1	2.83	5.84	2.51	4.72
Vehicles Produced in U. S. Plants	2,829,490	3,453,358	1,395,833	1,313,239	273,814	318,422
Avg. Employment	326,418	336,933	114,850	117,405	N. A.*	N. A.*

* Not Available
† Approximately

Ides of March were as painful to large corporations as to individual taxpayers. Automakers' sales volume last year matched 1950 but taxes took a big slice out of earnings

DETROIT

YOU CAN'T study the annual reports of automakers without remembering the demise of the goose that laid the golden eggs.

As usual there are plenty of people who believe that because earnings of the large corporations are in the millions they are making too much money and should pay their help more and reduce the price of their products. Not all these people are poorly informed on economic matters and many of them read beyond the headlines which announce the dollar figures on sales and profits. But few of them are able to keep in their heads the percentage figures which are as significant although not as spectacular.

A Losing Race—Saleswise, 1951 was an excellent year for the automakers. Their dollar volume compares very favorably with 1950 which was boom at its best. Profits, however, are quite another matter. Take General Motors Corp. and Chrysler Corp. as examples. For GM, dollar sales were only one per cent lower but net income was down 39 per cent. Chrysler's dollar sales were 16.2 per cent higher in 1951 but its earnings were off 43.7 per cent.

Statistics are boring to many people, and the automakers have a constant problem to present the pertinent facts in an understandable form. Try as they may, however, no substitute can be found for the cold hard facts which show up in tabular form. What they are trying to do this year is make their tables enticing enough to attract attention.

Painful To All—One thing is clear from a study of these figures: The Ides of March were as painful to large corporations as to the individual taxpayer. And some corporations are stressing that fact strongly. For example, General Motors segregates some figures pertaining to its tax load from its annual report and compiles these in a separate statement with a note that they are presented in such form because of the "unusual figures." It lists a total of ascertainable taxes of over $1.5 billion. Chrysler emphasizes that it alone in the past year paid taxes of about $172 per vehicle produced, and that the taxes which accumulate on a vehicle by the time it is sold account for about 30 per cent of the retail price.

Profit Cutters—The tax burden is only one of several reasons for the drop in earnings. Others of considerable importance are price controls without corresponding limitation on costs and government restrictions on civilian production. These factors count in varying proportion with individual companies, of course. For Chrysler and Studebaker a year-long hassle with the Office of Price Stabilization over its policy of forcing automakers to absorb much of their increased costs was a fundamental reason for their lower profit. For both companies sales dollar volume was at an all-time high. Taxes for both companies were less than they had been in 1950. General Motors and Packard on the other hand paid sharply higher taxes in 1951 and GM cited these as a primary reason for the lower net earnings. Packard's earnings were up in 1951 despite an income tax provision over twice as much as 1950.

Some of the more pertinent figures for three of the largest automakers are given in an accompanying table.

In Detail—General Motors' annual report is always a comprehensive document which goes into considerable detail to explain the the year's operations.

One of the most significant happenings of 1951, the report writers point out, was not the high total level of sales but the decline in civilian goods turn-out as the year went on. Fourth-quarter civilian sales were down 17 per cent in dollar volume under first quarter as the result of government production ceilings. Physical output was reduced even more. Deliveries of defense materials averaged $3 million per working day, and during fourth quarter were at the rate of $5 million a day. Inventories at year-end were substantially higher than at the end of 1950, increasing from $889 million to $1141 million, the result of accumulation in preparation for greater defense production and lower civilian output which reduced turnover.

Always an eye-opener are auto-

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Electronic Detectives

Electronics is making important contributions to the automotive field as illustrated by these two new devices. At left, a General Motors technician operates the Surfagage, a portable instrument that detects scratches as small as one-millionth of an inch. Chief advantages of the Surfagage are that it makes possible roughness checks as a simple shop operation and eases the problem of surface finish standardization. The dynetric balancing machine at right detects the slightest unbalance in torque convertors for fluid drive units at Chrysler Corp.'s Highland Park plant. If necessary the machine spot-welds directly to the convertor housing to bring the assembled unit into precise balance

makers' figures on how the dollars they take in are spent. An accompanying table shows how General Motors, Chrysler and Studebaker split their take.

Where the Money Went
(CENTS PER INCOME DOLLAR)

	GM	Chrysler	Studebaker
To Suppliers	49.25	67.00	71.45
Wages, Salaries	26.50	18.4	21.74*
Taxes	15.25	9.4	2.41
Stockholders	4.75	2.5	2.50
Retained by Corp.	2.00	.3	
Depreciation	1.75	2.4	1.84
Reconversion Set-Aside	.50		
Interest on Debt			.06

* Includes social security

Higher Outputs Sighted

Automakers came to a turn in the road when they won their fight with the government planners for a greater share of the available materials. Consensus is that the output quotas for next quarter have about the tensile strength of tissue paper. Officially the figures are 1,050,000 passenger cars and 250,000 trucks. These seemingly are merely guideposts, and in many quarters the comment is heard that they were set at midway points to save some faces in Washington.

With second quarter settled, the talk around Detroit now is about third and fourth quarters, and the most frequently mentioned figure for passenger car production is 1.5 million units in each of these periods. When the subject is up for discussion it is usually prefaced with ifs about a steel strike and about no widening of warfare.

Car Stocks at Postwar Low

Assuming that automakers will be able from here on out to make about as many cars and trucks as they want to, the big question automatically comes up—"What about sales?" Figures compiled by one of the specialists show field stocks of new cars at a postwar low, and some of the low-price lines already in short supply; although the over-all supply-demand situation continues to be spotty.

Normally, of course, stocks in dealers' hands should be high in preparation for the spring rush. Because they are low, the implication is a shortage will develop.

The cry, however, is being raised against the unfairness and unnecessarily severe terms of Regulation W. Representatives of the National Automobile Dealers Association and the National Used Car Dealers Association have called on Congress for its elimination. Credit men, too, are unhappy about this restriction. The arguments generally are that inflation is not the bugbear it once was, that the regulation hurts low-income classes disproportionately and that the materials the regulation was designed to conserve are becoming more plentiful.

There is, however, quite a large body of opinion which still contends that indirect curbs such as credit restrictions are a better way to manage the economy than direct controls. This group is not nearly so vocal.

Auto, Truck Output
U. S. and Canada

	1952	1951
January	409,406	645,688
February	461,294*	658,918
March		802,737
April		680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	**1952**	**1951**
Feb. 23	110,542	199,478
Mar. 1	118,397	177,567
Mar. 8	115,126	180,819
Mar. 15	118,777	182,888
Mar. 22	120,000*	174,674

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

New Car Designs Are Pushed

New car designs are being pushed by several makers, who made only face-lifting changes in their 1952s. The traditional tight-lipped secrecy is being maintained in this work, but some leaks inevitably occur. Thus, it is rumored around Detroit that die work for the new Chevrolet has been placed and there is considerable speculation as to whether this car will have an early introduction date. A completely new body is believed to have already gone through the engineering detail work and could appear before yearend if the division's top men want to give a hurry-up signal.

the Symbol of Quality in
ELECTRIC FURNACE STEELS

STANDARD STRUCTURAL ALLOY
BEARING QUALITY
ALLOY TOOL
SPECIALTY
NITRALLOY
CARBON TOOL
MAGNAFLUX-AIRCRAFT QUALITY

Hot Rolled • Forged • Annealed • Heat Treated • Normalized
Straightened • Cold Drawn Machine Turned • Centerless Ground

COPPERWELD STEEL COMPANY

WARREN, OHIO

117 Liberty Street
New York, New York

176 W. Adams Street
Chicago, Illinois

P. O. Box 1633
Tulsa, Oklahoma

1378 Union Commerce Bldg.
Cleveland, Ohio

7251 General Motors Bldg.
Detroit, Michigan

325 W. 17th Street
Los Angeles 15, Calif.

1140 Lockwood Drive
Houston 20, Texas

528 Fisher Building
Detroit, Michigan

3104 Smith Tower
Seattle, Washington

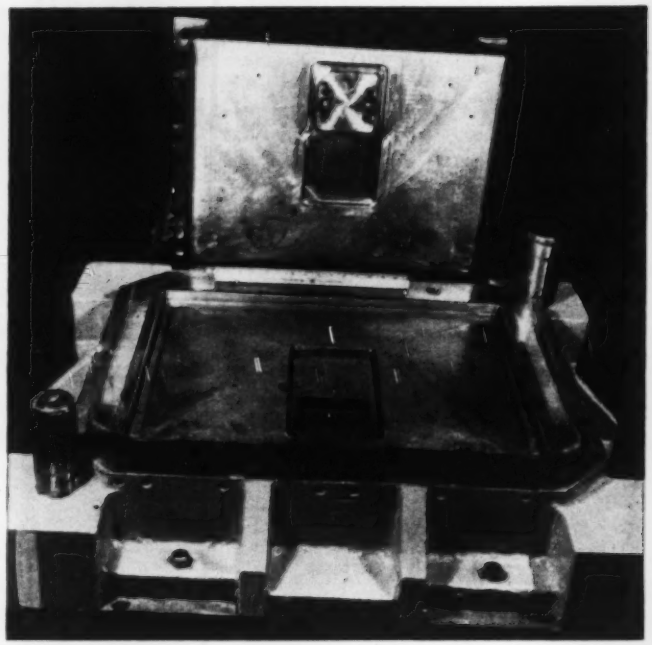
Monadnock Building
San Francisco 5, Calif.

803 Loew Building
Syracuse, New York

SELL YOUR SCRAP

45,000 score-free parts...after switching to GRAPH-MO steel dies!

THE Clark Grave Vault Company, Columbus, Ohio, ran into trouble in making sheet steel top panels for home appliances. Parts were coming off the dies badly scored. Expensive hand finishing operations were necessary. And production was very low due to pickup and galling on the dies. Obviously, the ordinary tool steel used in the dies wasn't doing the job.



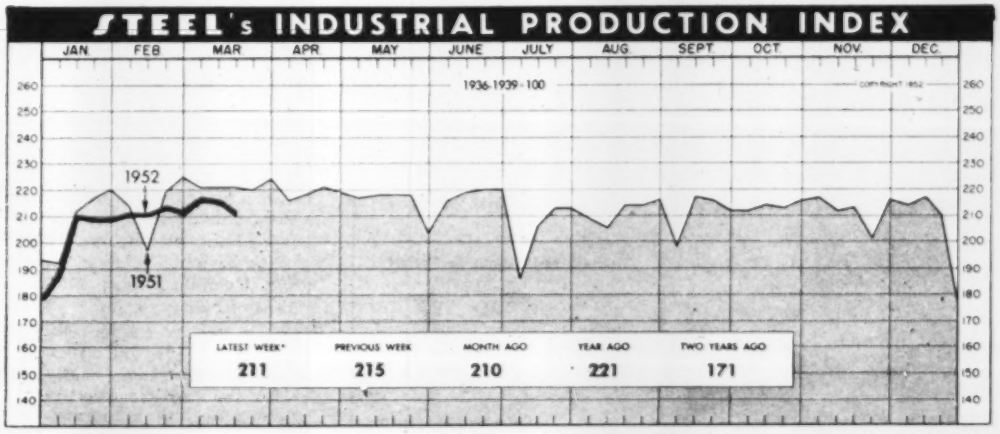
Engineers at The Clark Grave Vault Company started a search for a tool steel to replace the one they were using. They found the answer in Graph-Mo—one of four Timken® graphitic tool steels. When The Clark Grave Vault Company switched to Graph-Mo dies, pickup, galling and scoring were entirely eliminated. More than 45,000 pieces have been made on these dies and the dies are still turning out score-free panels.

Because of free graphite and diamond-hard carbides in its structure, Graph-Mo has outstanding low-friction properties—minimum tendency to scuff, seize, score or gall. Graph-Mo offers other advantages for dies, too. The free graphite makes machining to close tolerances quick and easy. The carbides in Graph-Mo offer unusually stubborn resistance to wear and abrasion. And Graph-Mo hardens uniformly with minimum distortion, gives a fine finish after polishing.

Timken graphitic tool steels are widely used in dies, gauges, machine parts and other applications. For further information, write for the enlarged 10th edition of the Timken Graphitic Steel Data Book. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.



* Week ended Mar. 15. Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Industrial activity index continues below year-ago level. Civilian goods producers and sellers look for fresh demand to blossom with the Easter season

WEAKNESS in demand for civilian goods may come to an end soon.

That's the optimistic view of many retailers and civilian goods manufacturers. They're looking for fresh demand for goods to blossom with the Easter season. So far, the buying urge hasn't been stimulated by price slashes. Many manufacturers, facing higher labor and production costs, are afraid to cut further.

Hoarding Cash—Still the consumer, after his pay check is trimmed by higher-than-ever withholding taxes, is setting aside in savings an estimated 10 per cent of his spending money. It's the withdrawal of this money from the stores that's hurting the retailers and civilian goods producers.

Long range views of 1952 seem to indicate that the buying lull is a temporary matter. Up to now, the government has planned for a guns-and-butter economy, and recent NPA increases of materials allocations indicate that there will be plenty of butter around in 1952. Meanwhile government defense spending and civilian plant expansions are planned to continue increasing, and many workers are in line for substantial wage increases. Those factors are expected to help reverse the tide of consumer purchasing by swelling the volume of money in spenders' hands. Even if civilian manufacturers and retailers are disappointed in the next few weeks, they insist the money will come out of hiding sometime this year.

Back To Normal—Industrial production was quick to recover from the effects of the sudden and short Midwest railroad strike. Tie-ups in freight carloadings and idleness in industry caused by the strike brought STEEL's industrial production index down 4 points from the previous week. Latest index reading (week ended Mar. 15) is 211 per cent of the 1936-1939 average. The index is now 10 points below its year-ago mark of 221.

Schedule Subject To Change . . .

Even with the threat of an industry-wide strike hanging over their heads, steel producers were scheduled to continue their record-smashing production climb last week. American Iron & Steel Institute estimated normal operations in the week ended Mar. 23 would yield 2,127,000 tons of ingots and steel for castings. Previous record, set the week before, was 2,114,000 tons. Output a year ago was 2,021,000 net tons.

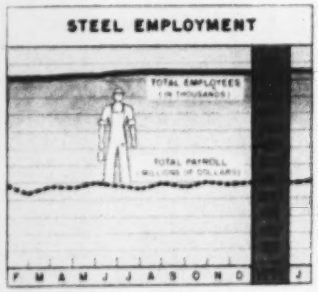
Production Revival . . .

Passenger car production will take a big jump upward in the remaining week in March, and the industry will turn out in April the best monthly production since August, 1951. That's the prediction of *Ward's Automotive Reports* which estimates that more than 400,000 cars will be shipped to dealers next month.

The releasing of more materials by the government to the industry is scrapping the industry's plans to roll through April, May and June at a slow production pace. Management may be banking on an even further relaxing of controls by the end of the quarter. In fact, says *Wards*, automakers with a few breaks may turn out a first quarter output close to the 1 million unit mark.

Present-day sales resistance may not last, at least when it comes to cars. Although some dealers are not convinced that they can sell the new cars, manufacturers seem convinced that new car supply and demand is far from being in balance.

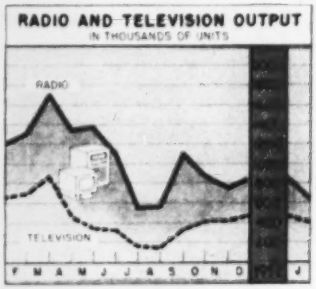
Car and truck manufacturers in the U. S. and Canada turned out



Steel Employment, Payrolls

	Employees† in Thousands		Payrolls in Millions	
	1952	1951	1952	1951
Jan.	672	657	$252.2	$245.3
Feb.		663		219.4
Mar.		663		238.3
Apr.		666		234.8
May		667		249.0
June		674		240.7
July		678		231.9
Aug.		679		247.7
Sept.		677		236.3
Oct.		674		249.9
Nov.		675		242.0
Dec.		673		246.7

† Monthly average. American Iron & Steel Institute

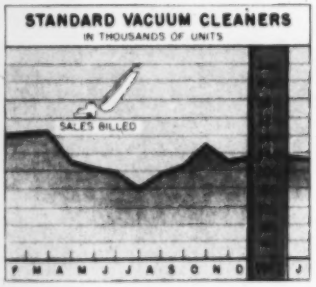


Radio and Television Output

Thousands of Units

	Radio		Television	
	1952	1951	1952	1951
Jan.	632	1,203	405	646
Feb.		1,313		679
Mar.		1,720		875
Apr.		1,337		469
May		1,373		349
June		1,083		327
July		548		152
Aug.		563		147
Sept.		1,109		337
Oct.		875		412
Nov.		748		415
Dec.		851		469
Total		12,714		5,267

Radio-Television Mfrs. Assn.

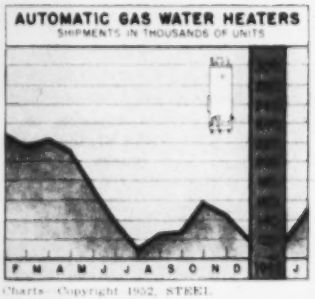


Standard Vacuum Cleaners

Sales Billed—Units

	1952	1951	1950
Jan.	223,357	282,305	249,150
Feb.		261,572	263,515
Mar.		290,242	261,014
Apr.		227,216	292,664
May		201,983	278,645
June		194,548	250,190
July		161,002	279,967
Aug.		191,299	341,232
Sept.		210,086	327,524
Oct.		259,469	331,445
Nov.		219,919	265,310
Dec.		230,263	288,756
Total		2,729,104	3,529,412

Vacuum Cleaner Mfrs. Assn.



Automatic Gas Water Heaters

Shipments in Units

	1952	1951	1950
Jan.	150,400	225,600	131,600
Feb.	146,100	213,400	156,500
Mar.		223,300	172,800
Apr.		199,400	176,400
May		167,400	195,200
June		131,500	207,100
July		102,400	197,500
Aug.		124,400	259,800
Sept.		130,900	222,600
Oct.		157,700	235,100
Nov.		145,300	206,000
Dec.		118,800	202,500
Total		1,931,200	2,363,100

Gas Appliance Mfrs. Assoc.

Charts—Copyright 1952, STEEL

Issue Dates of other FACTS and FIGURES Published by STEEL

Construction	Feb 11	Gray Iron Castings	Mar 17	Ranges, Elec	Feb 25
Durable Goods	Mar 3	Ironers	Jan 21	Ranges, Gas	Feb 25
Employ., Metalwkg	Mar 10	Indus. Production	Feb 18	Refrigerators	Feb 25
Fab. Struc. Steel	Mar 10	Malleable Castings	Mar 17	Steel Castings	Mar 17
Foundry Equip.	Mar 17	Machine Tools	Mar 10	Steel Forgings	Feb 25
Freight Cars	Mar 10	Prices	Feb 18	Steel Shipments	Dec 17
Furnace, Indus.	Feb 18	Pumps	Mar 3	Wages, Metalwkg	Jan 28
Gear Sales	Feb 11	Purchasing Power	Mar 3	Washers	Mar 3

a total of 118,777 units in the week ended Mar. 15. This is a rise of 3,651 units from the previous week's total of 115,126 and a drop of 64,111 units from the year-ago output.

Conservative Tenor . . .

Tenor of business remained conservative in February, while conditions continued to deteriorate, says Purchasing Agents Association of Chicago. The buyers' pessimism is a tipoff on business activity in the near future. Their placing or withholding of orders often determines how fast the wheels of industry spin.

While most of the association's members said production remained at fairly uniform levels, nearly one-half of the members reported lower order backlogs. Inventories continued to decline. Most of the members confined their purchasing within a 30 to 60 day hand-to-mouth range.

Faster deliveries were reported by two-thirds of the association's members. Buyers feel there are few, if any, commodities that can't be procured easily. In answer to a special question, 75 per cent of the association's members were of the opinion that the Controlled Materials Plan is not necessary at this time.

Refrigerator Comeback . . .

Factory sales of household refrigerators in January were highest since last June, says National Electrical Manufacturers Association. January output reached 260,259 units, well above the 195,403 made in December.

Electric range production improved proportionately. January factory sales rose to 80,826 from December's 73,241 units.

Prices Continue Softening . . .

Softening of wholesale prices continues with few signs of firming. Some products have slipped steadily for over a year; declines of up to 20 per cent are registered by some products. Over the year, metals and metal products prices have acted as a firming influence. Defense business assures no declines of major proportions, but

the dip in world metals prices indicates a slight weakening of the price structure in that category. All-commodity index of the Bureau of Labor Statistics (1947-1949=100) was set at 111.4 in the week ended Mar. 11. The classification All Commodities Other Than Farm or Foods registered 112.3.

Rise and Fall . . .

Though production of gas appliances rose briefly in January, manufacturers reported declines for February, says Gas Appliance Manufacturers Association. Shipments of domestic gas ranges approximated 150,400 units in February, down 2.1 per cent from January. In the first two months of the year 304,000 units were shipped, compared to 514,600 units shipped during the same period last year.

About 146,100 automatic gas water heaters were shipped in February making a total of 295,500 units shipped in the first two months. In the comparative period last year 439,000 units were shipped.

Shipments of gas-fired central heating equipment (boilers, furnaces and conversion burners) in February totaled 32,300 units, a drop of more than 10 per cent from the 36,200 shipped January.

Lower Levels . . .

Business failures are keeping to levels far below averages for the same periods in 1951 and 1950. Casualties in the week ended Mar. 13 totaled 156, compared to 185 and 208 failures in 1951 and 1950. Average of weekly failures for this year to date stand at 153, compared with 168 in 1951 and 206 in 1950.

Trends Fore and Aft . . .

Cash dividends of corporations issuing public reports totaled $506 million in January, a 2 per cent rise above the $494 million paid out during the same month last year. . .Loans to metalworking firms increased $30 million during the week ended Mar. 5. . .Construction contracts totaled $223.8 million for week ended Mar. 8, still within the new high range. . .Forecasts indicate that 22 new TV stations will start telecasting this year. Over 370,000 TV sets were shipped to dealers in January. . . Factory sales of mechanical stokers in 1951 were about 24,000 units, a decrease of 2.5 per cent from the 25,000 units sold in 1950. . . Net income of 131 Class I railroads skidded $15 million from the year-ago mark to about $42 million in January.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	101.5	101.5	99.5
Electric Power Distributed (million kwhr)	7,414	7,497	6 903
Bituminous Coal Output (daily av.—1000 tons)	1,652	1,715	1,680
Petroleum Production (daily av.—1000 bbl)	6,410[1]	6,420	6,047
Construction Volume (ENR—millions)	$223.8	$296.6	$220.9
Automobile, Truck Output (Ward's—units)	118,777	115,126	182,888
TRADE			
Freight Car Loadings (unit—1000 cars)	630[1]	714	745
Business Failures (Dun & Bradstreet, number)	156	170	185
Currency in Circulation (millions)[3]	$28,452	$28,464	$27,167
Dept. Store Sales (changes from year ago)[3]	−16%	−15%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,520	$16,910	$17,167
Federal Gross Debt (billions)	$260.2	$260.3	$255.2
Bond Volume, NYSE (millions)	$14.6	$14.5	$23.3
Stocks Sales, NYSE (thousands of shares)	6,947	7,263	10,436
Loans and Investments (billions)[4]	$73.4	$73.5	$69.5
United States Gov't. Obligations Held (billions)[4]	$31.7	$31.9	$30.6
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	243.4
All Commodities[7]	111.4	111.4	115 0
All Commodities Other Than Farm and Foods[7]	112.3	112.4	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

A. I. S. I.

4130

Government Specification
AN-QQS-685
CONDITION "N"

CHROME-MOLY STEEL
AIRCRAFT QUALITY

Earmarked stocks for aircraft or guided missiles.

Standard Size Sheets
.025" to ½" thick

Some lighter gauges can be furnished in coils.

Certification only

THE Kenilworth Steel co.
750 BOULEVARD
KENILWORTH, N. J.

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

Telephones: N. Y. COrtlandt 7-3427
N. J. UNionville 2-4900
Teletype: Roselle, N. J., 387

Saving Weight

TO SAVE MORE LIVES

How SPEED NUTS made important weight savings attaching plexiglas panels in Kaman Helicopter.

Let the engineers at Kaman Aircraft Corp., Windsor Locks, Conn., tell you how Flat-Type SPEED NUTS performed for them. "We found that lightweight SPEED NUTS provide a large bearing surface which eliminates the need for flat washers under nut. *They reduce the weight up to .31 pounds per hundred when replacing other lock nuts, not including savings on weight of washers.*

"Only one part to handle in assembly means faster, easier attachments. SPEED NUTS are retained in screw-receiving position by finger-tip pressure—no wrench needed to pull down NUTS. *These advantages add up to savings of approximately .15 man-hours per hundred fasteners.*"

If you would like to hear similar savings reports from *your* engineers, specify SPEED NUTS. Your Tinnerman representative can help you determine the right fastener for the job. Call him in soon. And write for your copy of "Savings Stories" Vol. II, Tinnerman Products, Inc., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A.—7 rue Henri Barbusse, Levallois (Seine) France.

Upper plexiglas panel is attached to frame in HTK-1 Helicopter by means of Flat-Type SPEED NUTS and machine screws. Detail of vibration-proof assembly is shown below.

Men of Industry

OTTO SVOBODA
. . . sales mgr. of E. W. Buschman Co.

W. J. LANGACHER
. . . chief eng., Aetna-Standard Eng.

RAYMOND J. ZALE
. . . Firth Sterling sales metallurgist

Otto Svoboda was appointed sales manager, **E. W. Buschman Co.**, Cincinnati, manufacturer of conveyors and material handling equipment.

David R. Warner was appointed sales manager, **Miller Electric Mfg. Co.**, Appleton, Wis. He was Denver district sales manager.

Charles R. Skinner, formerly assistant to the purchasing manager, was promoted to purchasing agent of raw materials for **Pratt & Whitney Aircraft Division**, United Aircraft Corp., East Hartford, Conn. He succeeds **W. P. McKown Jr.**, resigned.

William C. Myles was named manager of the Mobile, Ala., operations for **Tennessee Coal & Iron Division**, United States Steel Co.

Robert W. Duncan, formerly manager of scrap purchases, Sheffield Steel Corp., was appointed manager of purchases and sales, ferrous scrap, at **Aaron Ferer & Sons Co.**, Omaha, Nebr.

Vincent L. Bradford, vice president-sales, was appointed director of advertising, **Milford Rivet & Machine Co.**, Milford, Conn.

Stephen J. Tompkins was made assistant chief engineer of the truck design section, engineering division, **Chrysler Corp.**, Detroit. He is succeeded by **Robert M. Rodger** as chief engineer of Chrysler's Jefferson and Kercheval plants.

Aetna-Standard Engineering Co., Pittsburgh, appointed **W. J. Langacher** as chief engineer, and **G. E. Mandry** as assistant chief engineer, pipe and tube division. Mr. Langacher succeeds **Perry J. Snyder**, resigned to accept a position with Youngstown Sheet & Tube.

Harold C. Erskine, manager of the Cleveland works of **Aluminum Co. of America**, Pittsburgh, was named assistant division manager for Alcoa's die casting operations. He is succeeded by **H. J. Morrison**, formerly assistant works manager.

Electrol Inc., Kingston, N. Y., promoted **Victor E. Fletcher** from executive assistant to assistant to the president, and named the following vice presidents: **Howard B. Smith, Edmund D. Holland, George D. Logan** and **Rudolph Ratschitzky.**

Gus M. Bagnard was appointed chief engineer, **Chiksan Co.**, Brea, Calif. He replaces **Doyle C. Warren.**

Pittsburgh Forgings Co., Coraopolis, Pa., appointed **Frank G. Tuerk** as works manager of its Coraopolis plant, of which he formerly was general superintendent.

Harry C. Swanson, vice president-general manager, Arrow Pattern & Foundry Co., Chicago, and vice president, **Chicago Foundrymen's Assn.**, was made executive head of the latter to succeed **C. R. Lindgren.**

Raymond J. Zale was appointed sales metallurgist for **Firth Sterling Steel & Carbide Corp.**, Pittsburgh. He formerly was with Lindberg Steel Treating Co. and Darwin & Milner Inc.

Appointments in the commercial department, **United States Steel Co.**, Pittsburgh, include: **Francis Juraschek**, assistant director of distribution and availability; **Albert A. Monnett Jr.**, assistant director, commercial research; **R. B. Meneilly**, assistant to manager, tin plate sales; **George N. Schramm**, assistant to director, market development; and **Wallace Diffenderfer**, assistant director of organization and personnel.

George Fedurek joined **Continental Steel of Ohio Ltd.**, Fremont, O., as vice president. He resigned as manager of the Toledo sales office, United States Steel Supply Co.

William H. Gibbons was appointed advertising manager of **Tinnerman Products Inc.**, Cleveland. He joined the company in 1950 as assistant to the advertising manager, and prior to that time was with Jack & Heintz Precision Instruments.

Lloyd H. Herthneck was appointed manager, **Master Metals Inc.**, Cleveland, subsidiary, National Lead Co. He was also named a vice president of the subsidiary.

Brainard Steel Division, Warren, O., Sharon Steel Corp., appointed

Everett H. Gilmartin superintendent of industrial relations.

Spring Packing Corp., Chicago,

JOHN B. WELCH
. . . Spring Packing V. P.-industrial

elected **John B. Welch** vice president-industrial division. He formerly was assistant vice president. **George L. Green** was elected to the board of directors.

A. T. Carrow was appointed to the new post of manager of sales, **Cribben & Sexton Co.**, Chicago.

Curtis R. Henry, since last November a vice president, **Valley Mould & Iron Corp.**, Hubbard, O., was elected a director. He replaces the late **Samuel M. Phillips.**

Fuller E. Callaway Jr. was elected to the board of directors of **Hepenstall Co.**, Pittsburgh.

Gerry Attridge, assistant general manager, **Lovejoy Tool Co. Inc.**, Springfield, Vt., was elected a director to succeed **George Perry**, retired.

W. A. Irvine, former works manager, Canadian Electric Co., Montreal, was named manager of production engineering on the staff of the vice president-manufacturing, **Maytag Co.**, Newton, Iowa.

Stanley T. Rader heads the new Detroit office of **Consolidated Vultee Aircraft Corp.**, and **William A. Goodman** is in charge of the new Los Angeles office.

Ray M. Schneider was appointed eastern machinery manager, **Medart Co.**, at Pittsburgh.

Herbert A. Hemphill, effective Apr. 1, becomes president of **Texas Eastern Production Corp.**, Shreveport, La., subsidiary, Texas Eastern Transmission Corp.

J. A. Cragwall, vice president and manager, Kansas City Division, **General Box Co.**, Des Plaines, Ill., was elected president of the company. **N. W. Embry** becomes chairman of the board succeeding **E. E. Ames**, who continues as director. **Roy E. Welch** becomes manager at Kansas City.

Woodrow W. Shackleford was appointed to head the new sales regions established for Buffalo and upstate New York areas by **Eutectic Welding Alloys Corp.**, Flushing, N. Y.

John H. Butcher was elected president, **Butcher & Hart Mfg. Co.**,

JOHN H. BUTCHER
. . . president of Butcher & Hart Mfg.

Toledo, O. **H. E. Butcher** was named chairman of the board.

Ralph Domes joined the sales-engineering staff of **Winsmith-Buffalo**, industrial transmission specialist, Buffalo.

R. I. Warnecke was elected a director of **Roberts-Gordon Appliance Corp.**, Buffalo. He is chief engineer of the company.

J. D. Schneider was appointed general supervisor of the die room, and **E. H. Zuern**, general supervisor-design and dies for the Sapphire jet aircraft engine program at the forge plant of **Oldsmobile Division**, General Motors Corp., Lansing, Mich. These appointments were occasioned by the transfer of **Jacob L. Theis** who is in Australia to install and organize a new forge plant for GM at Melbourne. **S. J. Sivak** succeeds Mr. Schneider as chief die designer.

Allen Latham Jr. was elected a vice president of **Arthur D. Little Inc.**, Cambridge, Mass. He continues as technical director, mechanical division, in addition to having responsibility for its overall operation. **Leroy F. Marek** was named to the board and will have charge of the technical operations of the company.

Sanford J. Schoen was appointed assistant to the president, **Emergency Steel Service Corp.**, Skokie, Ill. **Scott F. Burton** was made sales manager.

Niagara Machine & Tool Works, Buffalo, opened a Philadelphia district sales office at Wynnewood, Pa., and named **Joseph J. Ortalli** district sales manager.

Theodore Howard was appointed manager of the Los Angeles branch sales office of **Mueller Brass Co.** He is assisted in his new duties by **Grant Hunter.**

John Monahan is the newly appointed New England district manager of **Bristol Brass Corp.**, Bristol, Conn.

Charles W. Stone, former secretary of **Interstate Drop Forge Co.**, Milwaukee, was elected a vice president and a member of the board of directors.

A. L. Jones was appointed manager, water treating division,

A. L. JONES
. . . mgr., water treating at Worthington

Worthington Pump & Machinery Corp., Harrison, N. J. He formerly was manager of the sale of

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Macro-etch through the longitudinal section of transmission part weighing 38 lbs. forged in closed dies. This shows how grain structure and fibre-like flow lines have been worked and controlled and concentrated by forging to provide the utmost strength and toughness essential for dependable performance.

Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

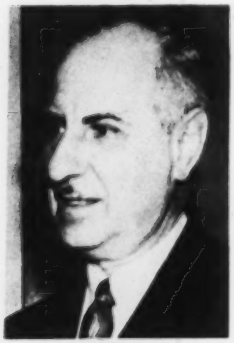
TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

ARTHUR A. LEVISON
Blaw-Knox div. V. P.-gen. sales mgr.



EARL P. CALKINS
. . . V. P. Lawndale Enameling

MERLE W. McLAUGHLIN
. . . mgr. Willys-Overland div.

water treating and deaerator section, steam power division.

Blaw-Knox Co., Pittsburgh, appointed **Arthur A. Levison** vice president-general sales manager of its Blaw-Knox Division. He has been a vice president in charge of the construction equipment department.

W. A. Glimn succeeds the late **C. M. Strong** as director of purchases, **Gar Wood Industries**, Wayne, Mich. Mr. Glimn was purchasing agent at the company's Findlay, O., division.

Frederick J. Underwood was appointed publicity manager, and **Philip H. Warren Jr.**, assistant publicity manager, **Heald Machine Co.**, Worcester, Mass.

Harold P. Mueller Jr. was named assistant sales manager, **L. J. Mueller Furnace Co.**, Milwaukee.

Fred M. Mozley was elected president, **Alliance Mfg. Co.**, Alliance, O. He succeeds the late **Sherman H. Bowles. Sidney R. Cook** was named to the board of directors to replace Mr. Bowles.

Lawndale Enameling Co., Chicago, elected **Earl P. Calkins** vice president. Since World War II he has served as a special representative to several metal products manufacturers in a consulting and engineering capacity related to fabricating and porcelain enameling operations. Mr. Calkins is also vice president of New Process D-Enameling Corp., Aurora, Ill.

J. A. Street, purchasing agent and supervisor of raw materials, Houston plant, **Sheffield Steel Corp.**, was promoted to manager of scrap purchases for the firm's three plants. He succeeds **R. W. Duncan**, resigned. Mr. Street will maintain headquarters at Houston.

J. B. Cooper will represent the engineering department of **AiResearch Mfg. Co.** of Arizona at its Los Angeles plant.

Edward L. Klopfer was elected vice president, **Gross Machinery Co. Inc.**, Buffalo.

Continental Can Co. appointed **J. N. Vincent** manager of its customer's plant layout department to succeed the late **H. L. Minaker.**

Merle W. McLaughlin was appointed manager, landing gear division, **Willys-Overland Motors Inc.**, Toledo, O. He joined Willys-Overland a year ago, and formerly was with Spicer Mfg. Division, Dana Corp. In his new position he is in charge of production of landing gears for Fairchild flying boxcars.

Machinecraft Inc., Whitman, Mass., announces that **Kenneth P. Swanson** is no longer connected with the company and that **Albert M. Shreiar** is now acting in the capacity of plant superintendent.

Michael E. Errico was appointed sales engineer, **Laminated Shim Co.**, Glenbrook, Conn.

Charles N. Sumwalt was appointed regional vice president of sales for the eastern United States by Baker-Raulang Co., Cleveland.

Robert B. Freeman was promoted to assistant to the vice president-operations, **Columbia-Geneva Steel Division**, U. S. Steel Co., Pittsburg, Calif. **Charles H. Fitzwilson** is his successor in the position of chief metallurgical engineer.

OBITUARIES . . .

William M. Green, 63, manager of the ore sales department, **Cleveland-Cliffs Iron Co.**, Cleveland, died Mar. 13, in Florida.

L. Ray Buckendale, 59, vice president-engineering, **Timken-Detroit Axle Co.**, Detroit, died Mar. 6.

Arthur W. Carlquist, 37, general sales staff manager for the **Gerrard Steel Strapping Division**, Chicago, U. S. Steel Co., died Mar. 11.

William E. Fertel, 60, for some years in the Cleveland sales department of **Luria Bros. & Co. Inc.**, died Mar. 13 while vacationing in the British West Indies.

Henry Hecht, 67, president, **Alloys & Products Inc.**, New York, died Mar. 12. He founded the company in 1919.

Charles B. Carter, president, **Alloys Foundry Co.**, Chicago, died Mar. 10.

Robert H. Duff, 54, assistant chief engineer for the **Dodge truck division**, Chrysler Corp., Detroit, died Mar. 5.

Robert E. Chapman, 57, general superintendent, **American Steel Foundries'** plant, Granite City, Ill., died Mar. 11.

Who can help increase foundry production and cut your molding costs?

YOUR OSBORN MOLDING ANALYST—To get greater foundry production, start first by consulting your Osborn Molding Analyst. He is factory trained to analyze your molding problems and recommend ways to conserve man-hours, improve working conditions and reduce scrap loss.

In the foundry shown, the Osborn Molding Analyst applied effort-saving Osborn Machines which increased mold production by 75%. Operations have been simplified, saving the physical energies of the molders and making the foundry a better place in which to work.

Why not call in your Osborn Molding Analyst now. Have him explain what advanced developments are being made to lower your foundry costs with improved methods and machinery. Call or write *The Osborn Manufacturing Company, Dept. 669, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Serving the Foundry Industry for Over 60 Years

Osborn Molding Machines

MOLDING MACHINES . . . CORE BLOWERS . . . INDUSTRIAL BRUSHES

Thread tapping is expensive... the old-fashioned way!

You know the costs involved in your thread tapping department—the time consuming operations involved—the consistent scrap rate of improperly threaded parts. Now, Eaton-Reliance offers "thread-cutting" Springtites and Sems to help reduce these production costs.

costs can be cut with Reliance "thread-cutting" (and timesaving) Springtites and Sems!

With Reliance "thread-cutting" Springtites and Sems you can reduce tapping costs and eliminate operations in your assembly work. Simply drill the hole—drive the screw. A 1-2 operation that cuts perfectly mated thread in the material and keeps bolted assemblies tighter longer. Test the advantages of Reliance "thread-cutting" Springtites and Sems—write for samples today, and reduce production costs.

FOR ALL MATERIALS

TYPE 1 for STEEL

Ideal for sheet steels and stainless. Standard machine screw threads plus Reliance lock washer for stronger, tighter fastenings.

TYPE 23
FOR DIE CASTINGS

Specially designed for die castings and metals that powder when driven. Standard machine screw thread and Reliance lock washer for exceptional tightness.

TYPE 25

For every type of Plastics assembly, Type 25 features spaced threads to keep stripping to a minimum.

Write today for your free copy of Bulletin S49A that describes Reliance "thread-cutting" Springtites and Sems

Reliance "thread-cutting" springtites and sems

EATON MANUFACTURING COMPANY, RELIANCE DIVISION

OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

Production AND Engineering
NEWS AT A GLANCE

LOOK, NO CRUCIBLES!—The problem of producing high purity metals in crucibles is being overcome by float melting, a laboratory process which relies upon levitation of the metal body by electrodynamic forces. By placing a lump of metal between two slightly conical horizontal copper coils a few inches apart and then passing a 10,000-cycle alternating current through the coil, the metal is lifted and becomes suspended between the coils. At the same time it begins to spin. Because of the induction heating effect, the metal gets hot and finally melts. Float melting eliminates the inevitable reactions between crucible refractories and metals being melted. Only molecules of gas touch the metal.

ORANGE PEEL OUT—Tendency of automobile lacquers to "orange peel" is eliminated by General Motors' new lacquer thinner. The formulation has a low boiling diluent and high boiling solvent, giving better surface smoothness with less polishing. Fewer coats of lacquer are needed to build up the specified paint film thickness. What about hot lacquer? GM says the new formulations accomplish most of the desirable results obtained by hot lacquering techniques and with fewer complications.

PRECISION SPUN SPHERES—Watchcase spinning technique combined with die stamping forms complex spherical aluminum segments for aircraft instruments, holding concentricity in horizontal and vertical planes to 0.007-inch. Precision forming process is complicated by gage of the aluminum (0.020-inch). Alternate forming and annealing, plus utilization of a water die simplifies the job. p. 68

CAPACITORS IN THE NEWS—Tantalum foil type electrolytic capacitors are expected to find wide application in the miniaturization program for electronic and signal equipment. Tantalum material in sintered-slug and in foil form is being investigated for capacitors in conjunction with suitable electrolytes. A new type instrument makes rapid measurements of the temperature coefficients (TC) of small temperature-compensating capacitors. In this method, long thermal-stabilization intervals are not required; measurement is made in a matter of minutes.

HOW THICK THE SHELL?—A magnetic permeability meter may replace the ball peen hammer in detecting dangerous weak areas caused by heat corrosion in aircraft exhaust manifolds, collector rings, headers and tail pipes. Stainless steel and Inconel alloys used in aircraft engine exhaust systems, when first installed, are of very low magnetic permeability. Corrosion and crystal-structure changes caused by excessive heat of the exhaust gases increase magnetic permeability of these materials. The so-called Magne-Probe is a sensitive and stable bridge which measures the inductance of a coil whose core is the structure being tested. Inductance of the coil is proportional to the permeability of the core materials, and therefore a measure of the heat-corrosion of the structure tested.

OUT OF THE LAB—X-ray diffraction, long a tool of the research laboratory exclusively, is doing a practical, fast, quantitative analysis job in many shops. Using high intensity x-ray tubes and Geiger counters, x-ray fluorescence analysis units reveal chemical content of a specimen in about 3 minutes. Once an appropriate analytical technique is established, any average laboratory technician can operate the equipment. p. 70

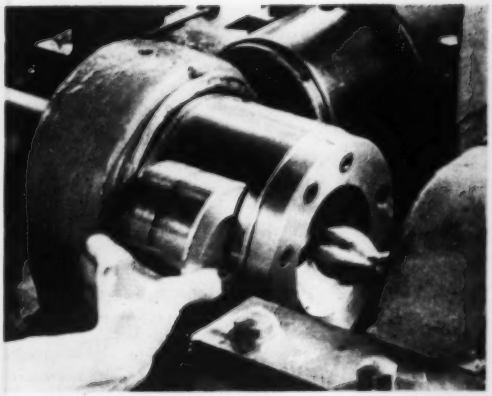
MORE KW PER LB—Development of the Navy's new high speed, light weight diesel-driven generator may result in revision of the armed forces standard generator operating speed from 1200 to 1800 rpm. The new units weigh about 50 pounds per kilowatt output, compared to 75 to 150 pounds of the old 900 and 1200 rpm generators. Light weight is achieved both through higher rpm and use of lighter alloys. The generators are 60-cycle, 3-phase, 4-wire, dual voltage units, capable of generating either 120/208 or 240/416.

DECONTROLLED STAINLESS—Straight chromium type stainless steels, decontrolled by NPA, are used widely in a variety of applications ranging from automobile decorative trim to chemical equipment. The chromium grades are corrosion and oxidation-resistant; they are forgeable, machinable, weldable. Many of these steels, currently substituting for scarce types will continue to be used after the present emergency. Chromium grades constitute about one-third of the total stainless production. p. 72

ART IN ENGINEERING—Boeing mechanics and construction men are spending less time these days pouring over blueprints. Replacing hundreds of time-consuming blueprints are composites that give a comprehensive picture at a glance. Technical illustrators go inside the experimental plane to sketch isometric drawings to a scale of one to ten. Resulting production drawings make it impossible for even a green hand to make a mistake. Idea was first tried out in World War II, but really comes into its own with today's complicated plane models.

1 Predawn aluminum cup in water die. When hit, internal pressure swells it to rough spherical shape

2 Cup distended by water pressure after hit. Top half of die has beveled cup to form rough sphere



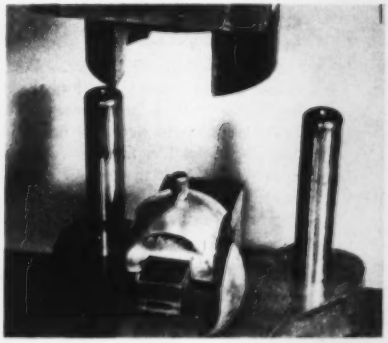
3 Inserting spinning die. A hydraulic ram holds die in position for roller to spin sphere from inside

PRECISION SPINNING . . .

Solves Ticklish Forming Problem

Perfect spherical segments for dials on aircraft gyro indicators are mass produced from aluminum by combining watchcase spinning techniques and die stamping

By BERNARD BLACKMAN
Superintendent
Keystone Watch Case Division
Riverside Metal Co.
Riverside, N. J.



6 Splitting sphere after spotwelding and drilling holes in brackets. Remaining segment must be handled carefully to prevent warping

AIRPLANE's vertical gyro indicator is a vital indicator of an aircraft's performance, and an essential flight tool for the pilot. Accuracy of the indicator is only as great as the precision built into the dial, a complex spherical segment having the letters "climb", "dive" lettered on it.

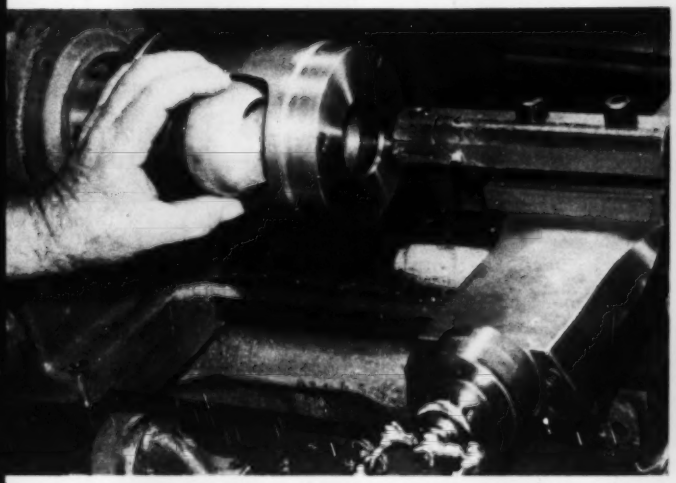
To Riverside Metal Co. fell the problem of producing this perfect spherical segment which, for maximum accuracy, must hold concentricity in both horizontal and vertical planes to within plus or minus 0.007-inch. Adding to the problem is the fact material is 0.020-inch gage aluminum, and brackets with two 0.094-inch diameter holes must be spotwelded to the inside curvature. For what Riverside considers one of the toughest spinning problems encountered, a combination of watch case spinning techniques and die stamping is used.

Forming process for the compound curvatures begins with drawing a $3\frac{1}{8}$-inch diameter cup on a double action press. Cup then is soft annealed and deep-drawn over a $2\frac{3}{8}$-inch diameter punch. Elongated shape is lathe trimmed and annealed for 10 minutes at 650° F.

During early experimental stages, spinning operation was attempted on the deep drawn cup after the first anneal. Instead of producing a sphere, the operation elongated the cup.

Water Die Helps—Solution was found in a water die, bottom half of which consists of a deep cylindrical die $\frac{1}{4}$-inch larger than cup to be formed, and a tapped hole for air ejection. Top half of die is a ring with an internal bevel. After cup is filled to a predetermined level with water, die gets pressure of approximately 10 tons. Internal pressure shapes bottom of cup; conical die bevels the top. A second hit gives maximum sphericity. Result of these operations is a rough sphere that must be spun.

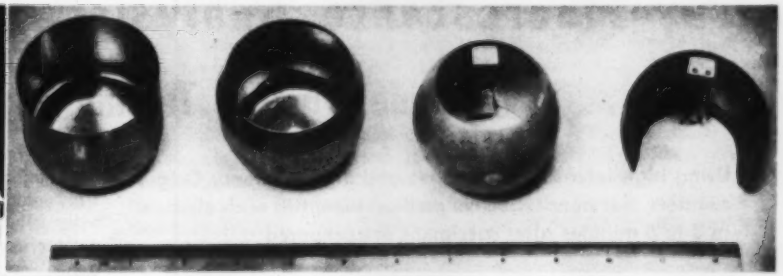
A lubricated ovoid roller conforms the aluminum to the exact shape of the cavity in a split circular die in the spinning operation. Cleanliness is of paramount importance. Small metallic particles adhering to inner die surfaces might ruin an entire run of spheres. Stress relieving under heat again



4 Sphere is inserted in special chuck for machining operation. Double cutters on boring bar eliminate necessity for turning sphere and also insure perfectly flat edges in the same plane

5 Machined sphere is checked for high spots and uneven wall thickness. Burrs are removed by lapping on crocus cloth

7 Inspector is giving sphere its test for concentricity before shipping



8 Four stages in producing a perfect spherical segment. Locating hole shown in third segment is punched out in the final step of the process

takes place after spinning. This warps the sphere slightly and a gentle respinning to regain perfect spherical shape is required.

Both sphere openings are line bored to within 0.002-inch on a lathe using a spherical chuck. A jackscrew holds sphere rigid while front and back cuts are made. Boring bar has double cutters to assure same plane for both flat edges. Burred or uneven edges are lapped on a crocus cloth over a lapping plate.

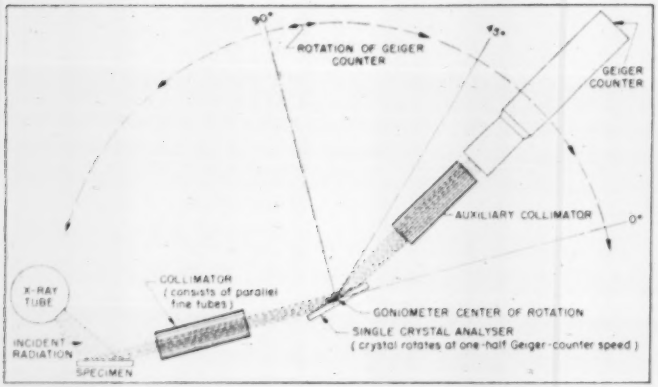
More Problems—With only a perfect sphere having two flat machined sides, there are still obstacles to overcome. Sphere must be split to provide the yoke-shaped segment that will be the indicator dial. Then two brackets must be spotwelded to yoke's exact center. Immediate cutting would pose problems of twisting and warpage, and centering of the brackets. Sphere therefore, is kept intact until after spotwelding and polishing is completed.

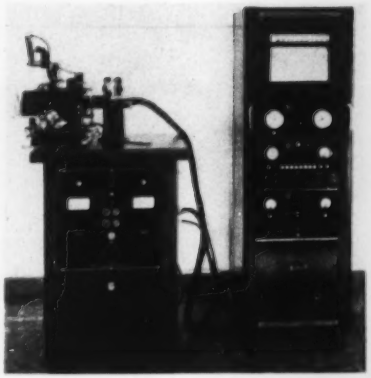
A pentagon-shaped locating hole is made to facilitate jig mounting and positioning the brackets. It also provides a practical method for basing all subsequent operations on the same flat side. Spotwelding brackets and drilling two small mounting holes make up the next operation, after which sphere receives a tripoli finish.

After polishing, sphere is split. Locating hole is used for the last time to position sphere over a die which punches out a 2-inch section containing the hole. Burred edges are then smoothed and buffed.

The sphere is now in its final form, a fragile balanced sphere segment, requiring careful handling to avoid twisting or bending the unsupported edges on its way to inspection. After inspection the sphere segments are carefully packed, shipped to the aircraft instrument company.

Upon arrival there, they receive a coat of black paint. Later both the lettering and the aircraft symbols for "climb" and "dive" are etched on the segment. Assemblies are then balanced and poised in the vertical gyro indicator.





Fluorescence analysis unit. Beam of x-rays causes elements in specimen to fluoresce, producing characteristic x-ray spectra. Fluorescent x-rays pass through collimator. This diffracts x-rays at angles having a relationship to their wavelengths and causes nearly-parallel beams of fluorescent radiation to strike analyzing crystal. Crystal separates various wavelengths so each may be detected by the Geiger counter and radiation intensity measured

X-ray Fluorescence Analysis . . .

Nondestructive Testing at Shop Level

Using high intensity x-ray tubes and high efficiency Geiger counters, this nondestructive method identifies each element in 3 to 5 minutes after specimens are prepared

By FRED BEHR
Research & Control Instruments Division
North American Philips Co. Inc.
New York

X-RAY fluorescence analysis is out in the shop to stay. The nondestructive technique is used daily in many plants for fast quantitative analysis of high alloy steels and difficult-to-analyze high temperature alloys of the chromium-nickel-cobalt type.

Analysis consists of inserting a specimen, setting the crystal and the Geiger counter at proper angles to detect radiation, measuring the intensity in counts per second. The intensity is compared with the intensity of a standard specimen of somewhat similar composition and characteristics. Operation is simple. An average laboratory technician can operate the equipment, once an appropriate analytical technique is established. Analysis takes about 3 to 5 minutes for each element.

Fluorescence is produced by incident x-radiation of high intensity —that is, short wavelength and high energy level. By irradiating a specimen, characteristic x-radiations of elements in it may be produced. Then, by using x-ray diffraction methods, the various wavelengths may be separated and measured. Intensities can be determined to give the percentages of each element in the specimen.

Analysis is independent (except for absorption effects) of the state of the element in the sample, whether it be free, combined or alloyed. The method can be used to detect all elements from titanium to uranium, and by comparatively simple alteration, the range can be extended several elements lower than titanium in atomic number.

Tubes Water Cooled—Complete fluorescence analysis unit includes four major components: 1. Basic x-ray unit; 2. special irradiating x-ray tube; 3. wide-range Geiger counter goniometer, and 4. electronic circuit panel with strip-chart recorder. Basic x-ray unit comprises a power transformer and electrical circuits and other accessory equipment needed for operation of the water-cooled x-ray tube.

Special water-cooled x-ray tube is oil-insulated and is connected to the basic x-ray unit through flexible cables which supply water and electricity. Wide-range goniometer is made up of a scanning mechanism and Geiger counter tube designed for measuring the angular positions and intensities of the fluorescent x-radiations.

Goniometer Design — To understand the goniometer design, imagine a circle with a horizontal line drawn through its center. Call the point where the line intersects the circumference on the right 0 degrees and lay out a graduated scale to plus 180 degrees around the circumference in the counter clockwise direction, and to minus

180 degrees in the clockwise direction.

Place an x-ray beam at the point where the line intersects the circumference at the left (180 degrees) and aim the parallel rays along the horizontal line toward the center of the circle. A Geiger counter tube is then mounted so its window is always aimed at the center of the circle, yet can be moved to other positions around the circle.

A crystal is mounted at the center of the circle; its face plane is maintained by mechanical means in an accurate relationship with the Geiger counter tube position. Actually, face plane of the crystal, if extended, always bisects the angle between the counter tube and the horizontal line or x-ray beam.

Electronic circuit panel incorporates a high voltage supply for the Geiger counter tube, scaling circuit, rate meter, stabilizer, operating controls and other electronic circuit components. The strip-chart recorder is a specially-designed unit with a tracer pen calibrated for intensity readings and a degree-marking pen which indicates angular positions.

To record angular position and intensity measurements, it is necessary to scan a suitable arc with the Geiger counter. This is accomplished with the goniometer.

Analysis Limited—Analysis of low percentages of any element is limited by the relationship between background radiation intensity and the intensity of the line of the element involved. Effect of self-absorption of the characteristic radiation of the element by the materials of the specimen is also a factor in determining the lowest percentages which may be practically analyzed. Specimens in which the main constitutent is a high density element, will absorb a higher percentage of the radiation involved than will be absorbed by a lighter element. For instance, nickel in an aluminum alloy can be determined to a lower percentage than is possible in a silver or lead alloy, in which the absorption of nickel K radiation is high.

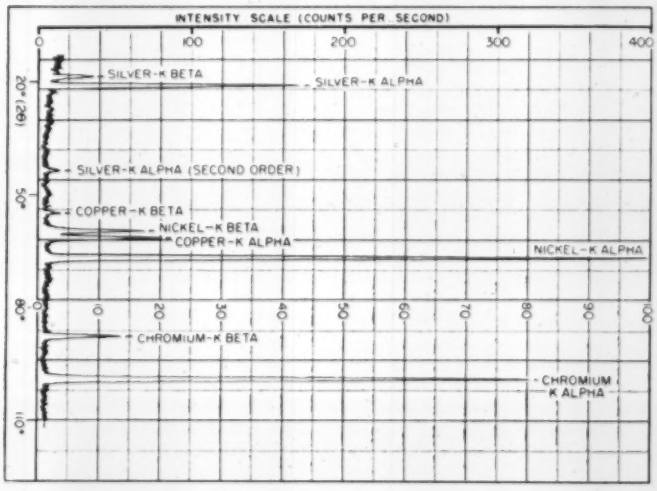
The specimen can take any one of a number of forms. If it is a liquid or is in solution, the material is placed in an open-faced level holder. In vapor form, it may be placed in the same holder with a thin transparent membrane cover. Powdered material is placed in an open-faced holder and the surface pressed flat. Metal specimens are cut to about 1 inch square by 1/16 to 1/4-inch thick, to provide optimum thicknesses; foils or evaporated films can be placed in the specimen holder. Irregularly shaped specimens, in which cutting or deforming is impractical, can be placed in the specimen holder in such a position that irradiation of a face can be accomplished.

Secondary Standards — Each specimen becomes a secondary standard, and may be used to extend the supply of standards, because there is no change in the specimen caused by the analysis. Since the radiation covers a relatively large area of the specimen (approximately 5/8-inch square as viewed by the collimator) the effect of segregations and nonhomogeneity is not so important as it would be in spectrographic analysis where a relatively small area is contacted by the arc or spark.

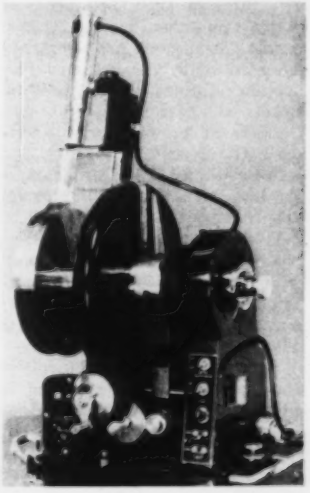
Accuracy of quantitative analysis varies with the nature of the specimen components. Optimum accuracy, in the order of one-half of 1 per cent of the element present, may be obtained under most favorable circumstances. This accuracy is not expected in direct readings on elements of a low order of detectability, or from unusually small specimens, or at limiting percentage ranges.

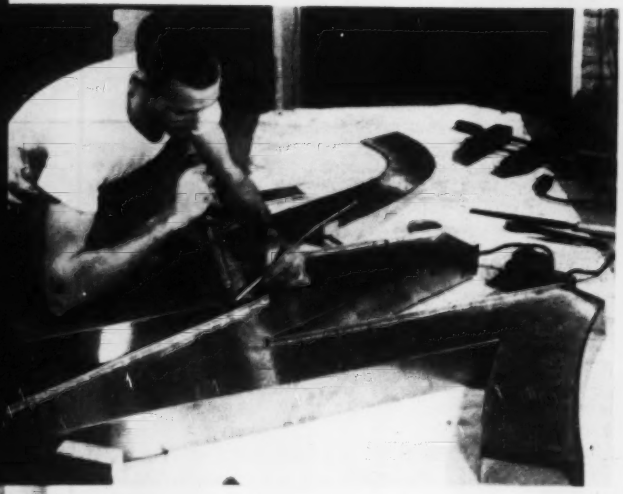
Recent advances in the technique have greatly extended the range of detectability.

Typical fluorescence chart of a chrome-nickel plating on silver-copper base showing horizontal scale graduated for intensity (counts per second) and vertical scale which is graduated for diffractional angle (degrees)

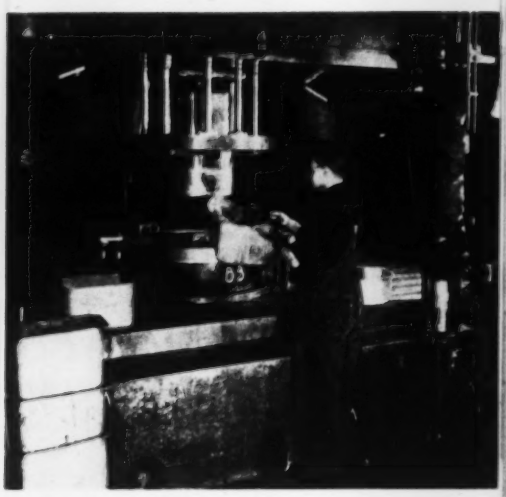


Closeup of wide-range goniometer, with protractor, Geiger counter, slit assemblies filter and specimen holders





Soldering to join parts of stainless steel. Face is 20 gage, sides are 18 gage. Fabricator makes extensive use of band saw, power brake and special forming rolls



Deep draws like the sink tubs shown above or domestic washing machine tubs are regularly produced from type 430 straight chromium steel, often in a single draw

Decontrolled Stainless: A Solution to Shortages

Straight chromium grades no longer requiring CMP-4B tickets are worth investigating as a solution to many fabricating problems. Producers are looking for business

NOW IS a good time to see whether the straight chromium stainless steels may be used in your products either on their own merits or in place of other hard-to-get materials. These steels are completely decontrolled by the National Production Authority and CMP-4B tickets no longer are needed to purchase them. Producers are looking for business, especially in the flat-rolled classifications. Chromium, in the form of ferroalloys, is in freer supply.

In contrast, the defense effort is requiring chromium-nickel steels with greater nickel content and this versatile metal consequently may not be available for use in quantity for some time to come.

Shortage Is Aid — The nickel shortage actually is contributing to the greater availability of the non-nickel-bearing straight chromium types. Under order M-80 producers get a given amount of nickel regardless of the grade mix. As more of the higher-nickel-type stainless steels are specified, the greater the capacity available for producing the free chromium types.

In relieving the chromium types from controls through issuance of direction 9 to CMP regulation 1, NPA defined them as stainless steel containing less than 1 per cent nickel. This means that all of the 400 series steels can be purchased without restriction from mills or warehouses with the exception of types 414 and 431 which contain 1.25 to 2.50 per cent nickel. Although by definition non-nickel-bearing types 501 and 502 should be decontrolled, they are included in the NPA melt schedule and distribution still is regulated under the Controlled Materials Plan.

Stainless Types—American Iron & Steel Institute's manual on stainless steels lists 29 standard types. In addition there are a half dozen variations, such as 17-7 chromium-nickel with aluminum and titanium providing age-hardening characteristics and 430T, a newer, weldable straight chromium steel. The following are the three general types.

Included in the hardenable chromium steels (martensitic, magnetic) group are: Types 403, 410, 414, 416, 420, 431, 440A, B, and C and 501 and 502. On heat treatment, these steels develop a wide range of mechanical properties. All are on the free list with the exception of 414, 431, 501 and 502.

Nonhardenable chromium steels (ferritic, magnetic) include 405, 430, 430F and 446, all on the free list. Maximum softness, ductility and corrosion resistance are developed in an annealed condition.

Nonhardenable chromium-nickel steels (autenitic, nonmagnetic) are all in the familiar 300 series and include types 301, 302, 302B, 303, 304, 305, 308, 309, 310, 314, 316, 317, 321, and 347. They are not hardenable by heat treatment but

do develop a wide range of mechanical properties through cold working. They provide maximum resistance to corrosion and are readily fabricated. Variations containing columbium, selenium, sulphur, molybdenum, silicon and titanium provide special characteristics such as greater stability, freer machining and resistance to corrosion.

All chromium-nickel grades are subject to full NPA controls and CMP tickets are required for purchasing. Beginning with second quarter of 1952, producers of class B products can obtain priority assistance for no more than 500 pounds of nickel-bearing stainless steels in any three-month period without applying to NPA on form CMP-4B. Previously, 1500 pounds could be obtained on self-certification of orders.

Place of Chromium Types—The austenitic 18-8 stainless steels long have held the lead in popularity because they are easy to draw, bend, solder, braze, weld and otherwise fabricate, thanks to their nickel content. However, the Stainless Steel Committee of the American Iron & Steel Institute points out (STEEL, Aug. 20, 1951) that the chromium stainless steels, far from being unknown alloys, consistently represent about one-third of total stainless steel production. In 1950, the percentage was 40 and for type 430 alone it was 28.

Forms and prices: Bars, wire and structurals 27.25c; plates 28.50c; sheets 38.00c; cold-rolled strip 35.50c; billets 22.75c.

Type 410, lowest cost of all the stainless steels, is a high strength 11.50-13.50 chromium type that responds readily to heat treatment and displays excellent resistance to corrosion and oxidation. Corrosion resistance is not quite as high as for type 414 which is still controlled.

It may be readily drawn, forged and cold worked. Welds should be annealed. It machines at about 55 per cent of the speed of bessemer screw stock. Principal uses are in the oil, chemical, paper and railroad fields. It also may be used for furnace parts where operating temperatures are not over 1200° F. Other uses include screws, bolts, valve parts, knife blades and surgical instruments.

Forms and prices: Bars, wire and structurals 25.75c; plates 27.00c; sheets 36.50c; cold-rolled strip 30.50c; billets 21.50c; tubing.

Type 416—This 12-14 chromium steel, is a modification of type 410 having similar corrosion resistant, heat treatment and other properties. However, through the addition of sulphur, phosphorous or selenium it has been made the most readily machinable of the stainless steels and may be used for high production runs in automatic screw machines. Machinability compares favorably with that of B-1112 bessemer screw stock.

Forms and prices: Bars, wire and structurals 26.25c; plates 27.50c; sheets 37.00c; cold-rolled strip 37.00c; forging billets 22.00c.

Type 420 due to higher carbon content, this 12-14 per cent chromium steel can be hardened to a maximum of approximately 500 BHN. Maximum corrosion resistance, may be obtained only in the full hardened condition.

It is used for valves, valve seats and stems and shafting where resistance to wear and corrosion are important. It is well suited for cutlery, bearings and similar applications.

Forms and prices: Bars, wire and structurals 31.25c; plates 34.50c; sheets 44.00c; cold-rolled strip 47.00c; forging billets 26.25c.

Type 420F — Modification of type 420 through the addition of sulphur or selenium improves its machinability. It may be machined at about half the rate for bessemer screw stock.

Stainless strip being belt-polished may hold in its mirror-like finish a reflection of things to come for industry now that it is decontrolled

Forms and prices: Bars, wire and structurals 32.25c; cold-rolled strip 48.00c; forging billets 27.00c.

Type 430—Regarded as the best stainless steel available in quantity for unrestricted general use today, type 430 possesses great resistance to chemical and atmospheric corrosion and to oxidation up to about 1600° F. It has high strength and may be easily fabricated.

Largest use is for decorative trim on automobiles and buildings. Other applications include chemical equipment, tobacco and rubber plant machinery, oil burner parts and television tube cones. It cannot be hardened. It requires more maintenance than type 302 (18-8) when exposed to the outside atmosphere but cleaning will keep it bright. It is not as easy to draw as type 302 and more attention must be given to die design and preparation. When stretch formed, the metal tends to neck down locally but that disadvantage ac-

Decontrolled Stainless Steels

Type	Description	Alloy Content C	Cr	Other
403	Turbine Quality	0.15 max.	11.50-13.00	.....
405	Stainless and Heat Resisting Applications	0.08 max.	11.50-13.50	0.10-0.30 Al
406	Heat Resisting Applications	0.15 max.	12.00-14.00	3.50-4.50 Al
410	General Purpose	0.15 max.	11.50-13.50	.....
416	Free Machining, General Purpose	0.15 max.	12.00-14.00	P,S,Se,Zr.
420	Hardenable Grade	0.15 min.	12.00-14.00	.....
420F	Free Machining	0.15 min.	12.00-14.00	P,S,Se,Zr.
430	General Purpose	0.12 max.	14.00-18.00	.....
430F	Free Machining	0.12 max.	14.00-18.00	P,S,Se,Zr.
430TW	Welding Grade	0.10 max.	16.00-18.00	0.25-0.70 Ti
440A	Hardenable Grade	0.60-0.75	16.00-18.00	.....
440B	Hardenable Grade	0.75-0.95	16.00-18.00	.....
440C	Hardenable Grade	0.95-1.20	16.00-18.00	.....
442	Corrosion and Heat Resisting Applications	0.25 max.	18.00-23.00	.....
446	Corrosion and Heat Resisting Applications	0.35 max.	23.00-27.00	.....

tually becomes an advantage in fabricating by spinning. Ductility is about three-fourths that of deep drawing quality carbon steel.

Forms and prices: Bars, wire and structurals 26.25c; plates 27.50c; sheets 39.50c; cold-rolled strip 31.00c; forging billets 22.00c; tubing. Type 430 is less expensive than type 302 but higher fabrication costs largely offset the saving.

Type 430F—The free machining variation of type 430 has practically the same mechanical properties and is suitable for the production of parts on automatic screw machines. It may be machined 85 per cent as fast as bessemer screw stock, compared with 55 per cent for type 430. It does not cold form quite as well as 430.

Forms and prices: Bars, wire and structurals 26.75c; plates 28.00c; sheets and cold-rolled strip 39.50c; forging billets 22.50c.

Type 430TW—New modification of type 430 (with 0.25-0.70 titanium), produces fairly ductile welds in both the as-welded and annealed conditions. Fusion welding with an inert gas shield has produced the best results but all methods may be used except forge welding. Where filler rods are necessary, types 304 or 310 are recommended for greater ductility.

Forms and prices: Bars, wire and structurals 30.75c; plates 32.00c; sheets 43.50c; cold-rolled strip 35.50c; forging billets 26.50c; tubing.

Types 440A, B, C are three high carbon 16-18 chromium types identical except for respective carbon contents of 0.60-0.75, 0.75-0.95 and 0.95-1.20 per cent. They may be heat treated to 500-560, 520-590 and 540-620 brinell, respectively, and are corrosion-resisting only in a fully hardened condition. After hardening, the 440 steels are more corrosion resistant than hardened types 410 or 420.

Uses include carving knives, surgical and dental instruments, valve seats and plugs, balls for valves and bearings, ball bearing races and shear blades. Forms and prices: Bars, wire and structurals 31.25c; plates 34.50c; sheets 44.00c; cold-rolled strip 47.00c; forging billets 26.25c.

Type 440F—A version of the 440 types, it acquires its free-machining characteristics through the addition of sulphur or selenium. It machines about 10 per cent faster than 440C but must be heat-treated with greater care to avoid stress cracking.

Forms and prices: Bars, wire and structurals 32.25c; plates 35.00c; sheets 44.50c; cold-rolled strip 48.00c; forging billets 27.00c.

Type 442, with chromium content of 18.00-23.00 per cent, is suitable for corrosion and heat resisting applications. Corrosion resistance is not much greater than for type 430 but heat resistance is superior.

Forms and prices: Bars, wire and structurals 29.75c; plates 31.50c; sheets 43.00c; cold-rolled strip 42.50c; forging billets 25.00c; tubing.

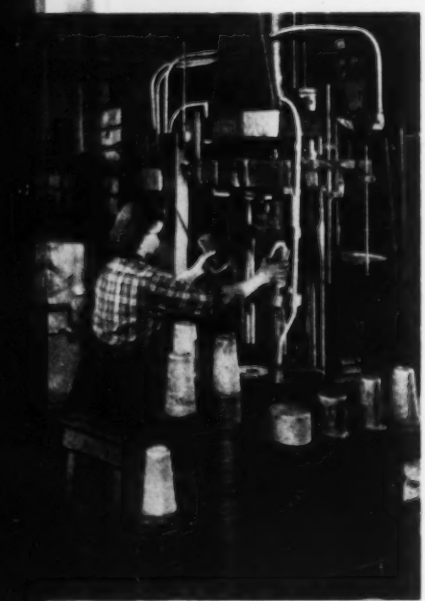
Type 446 — High temperature applications where resistance to oxidation is important are well suited to type 446 containing 23-27 per cent chromium. It resists destructive scaling in oxidizing and reducing atmospheres up to 2000° F. It has the lowest coefficient of thermal expansion of the stainless alloys which makes it adaptable for glass to metal sealing.

Forms and prices: Bars, wire and structurals 35.25c; plates 36.50c; sheets 53.50c; cold-rolled strip 63.50c; forging billets 29.75c; tubing.

Decontrolled Stainless Applications

Here are some of the present applications for type 430 stainless steel sheet, strip, bar and wire. It is the most popular of the decontrolled straight chromium steels for general use.

- Army field ranges
- Army tank mufflers
- Beverage coolers
- Cafeteria serving counters
- Coal dewatering screens
- Dental instruments
- Dishwashing machines
- Electrical cable spinning wire
- Food display cases
- Food refrigeration thermometers
- Heat exchanger tubing
- Hospital cabinets
- Hospital chart carriers
- Hospital table tops
- Ice cream cabinet tops
- Ice cream freezers
- Irrigator stands
- Laboratory counters
- Ladle handles
- Lock tumblers
- Meat slicer parts
- Mess trays
- Motor coach interior trim
- Paper mill doctor blades
- Smoke urns
- Steam cooker racks and trays
- Surgical instruments
- Tent heater combustion drums
- Textile loom heddles
- Textile loom reeds
- Typewriter parts
- Vending machine parts
- Water cooler tops
- X-ray machine parts

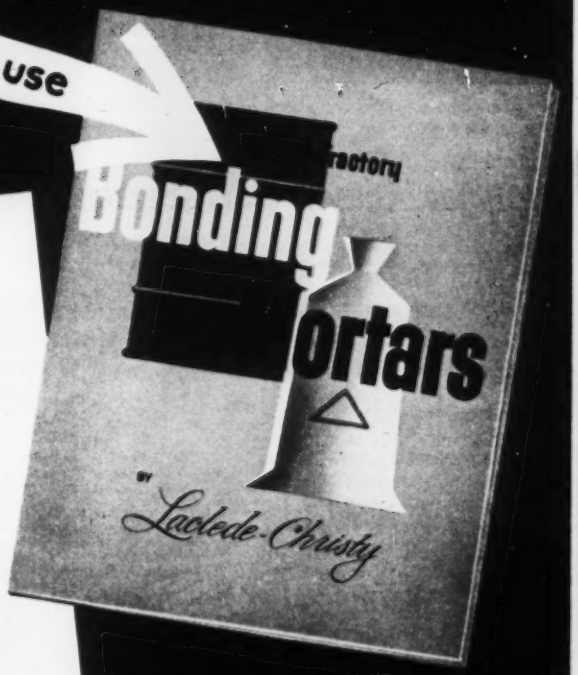


Cups for beverage mixers being deep drawn from type 430 stainless steel. Scoring and galling aren't evident

Steelmaker Turns to Tank Armor

Crucible Steel Co. of America, producer of armor-piercing shells in two world wars, is turning its efforts to steel armor plate for Army tanks. W. D. Gross, works manager at the company's Spaulding plant in Harrison, N. J., says tests at Aberdeen Proving Grounds, Md., show its plate meets ordnance specifications. This means approval for quantity production of the heat-treated ballistic castings at Harrison, where the firm will also subcontract several other small cast armor tank parts.

What to use... where and how to use



This new catalog was published as a helpful guide to furnace designers, operators and refractory users in the selection and use of refractory mortars wherever fire clay brick or insulating brick is used.

Photos and technical data describe the properties of more than a dozen high temperature cements—how to prepare and mix them; how to estimate requirements; where and how they are properly applied.

Furnace men—in fact, all refractory users who want the most serviceable and economical installation – should have a copy of this catalog. We will send copies just as long as our supply lasts. Write today.

New 20-page Catalog

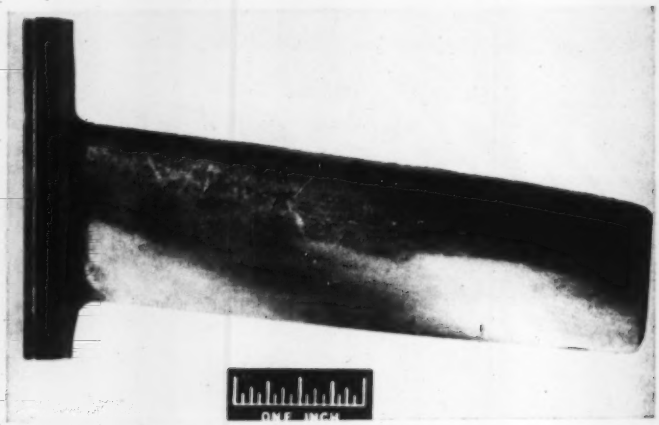
Quality First

Laclede-Christy Company

ARCADE BLDG., ST. LOUIS 1, MO.

Branch Offices | NEW YORK • INDIANAPOLIS • CHICAGO • MILWAUKEE • PITTSBURGH
HOUSTON • LOS ANGELES • SAN FRANCISCO • SEATTLE

Hydrogen evolving from a compressor blade in deaerated water at 180° F



Edge ground blade cracked after 24 hours in a 10 per cent electrolytic caustic soda solution. No material loss was evident during the test cycle

Hydrogen Causes Embrittlement of Forged Compressor Blades

Electrolytic surface corrosion builds up hydrogen pressure resulting in eventual cracking of the blades. Painting decreases susceptibility to embrittlement

By A. E. DURKIN
Thomson Laboratory
General Electric Co.
Schenectady, N. Y.

CORROSION cracking of compressor blades posed a problem several months ago when a mild epidemic of blade failures occurred in the field. Cracks appeared on trailing edges of blades and were confined to the cooler end of the compressor. Investigation revealed the cracked blades had been machined while it was still practice to edge grind them during manufacture. Grinding caused the edges to burn slightly. Conclusion was that cracks were due to residual stresses induced by grinding and burning. Stresses were assumed enough to exceed tensile strength of blade material.

Failures of blades in the field were studied along with failures produced on 410 stainless strips in various acid and caustic solutions. Results showed cracking is due to hydrogen embrittlement and not to stress corrosion. Hydrogen present in blades is the product of electrolytic surface corrosion, the result of a reaction between the moisture in the atmosphere and dirt or other foreign matter on the blades.

Pressures Build Up—Atomic hydrogen resulting from this corrosion enters blades to form molecular hydrogen at the metal disjunctions or areas of residual stresses caused by grinding. High internal pressures build up when this molecular hydrogen is formed. When pressure coupled with residual stresses exceeds the tensile strength of the blade material, blades crack in the deformed areas.

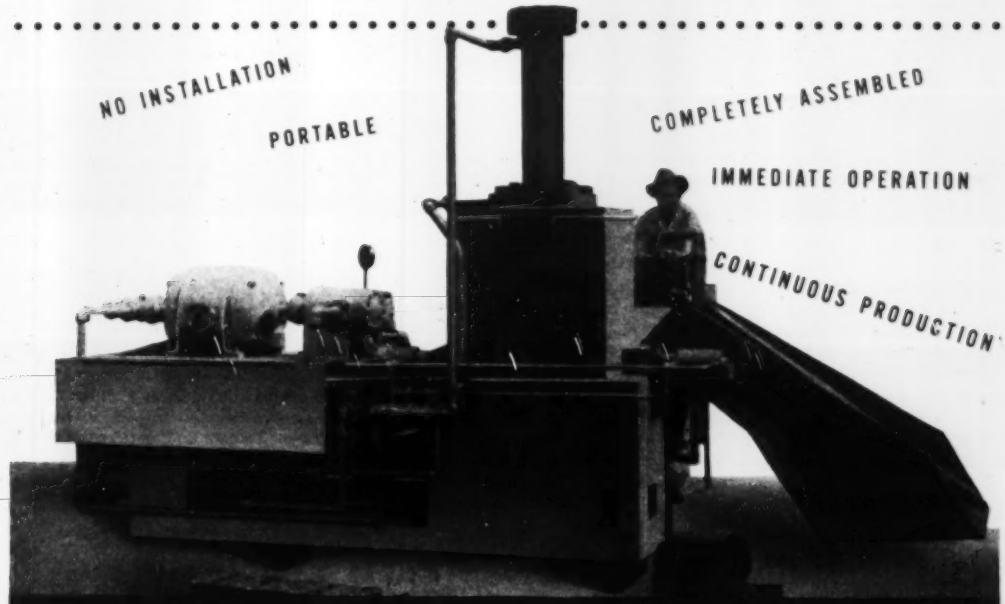
When hydrogen embrittlement produces cracks, three elements cause failures: Deformations or stresses due to grinding; pressure of hydrogen in the deformed edges; stress concentrations due to metal attack. If cracks are produced by caustic embrittling, only the first two elements are present. In acid there are three elements. In any event, when sum of these pressures is sufficient to exceed tensile strength of the material, failures are observed. Tensile strength of blade material is exceeded in a much shorter time in acid pickling solutions than in caustic solutions. Certain elements in the periodic table also cause embrittlement and are classified as promotors or poisoners. Among these are selenium and sulphur.

How Much Hydrogen?—Susceptibility of blades to hydrogen is shown in illustration. Blade was made the cathode in a 10 per cent caustic solution for 30 minutes. At end of period, blade was removed, washed in cold water and placed in deaerated water at 185° F. Hydrogen was given off as shown in the illustration. On other tests, as much as 5 to 7 cc of hydrogen was displaced.

To determine exact amount of hydrogen present in field blades, two failed blades were obtained for tests. These had been rejected because of minute cracks on their edges and were not typical of cracked field compressor blades. Blades were cut in small sections and analyzed for hydrogen along with an artifically embrittled blade.

Hydrogen content on the embrittled but unburned blade was 6.5×10^{-6} grams of hydrogen per gram of blade material. Blade No. 1 showed a hydrogen analysis of 4.0×10^{-6} grams of gas per gram of blade material. Blade No. 2

Harris Non-Ferrous Metals Baling Presses

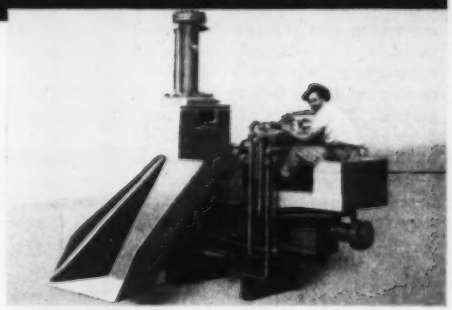


Bundle Size Attracts Dealers and Smelters

The HARRIS Non-Ferrous Metals Baling Presses were designed primarily for use in baling non-ferrous scrap. A particular feature of this design is that continuous baling is obtained, since the charging box is open while the bale is being made and ejected. The charging box is large enough to handle bulky material such as wire, sheets, etc. Pressures used make an exceptionally dense bale—approximately 40% density.

Dealers find these presses excellent also for baling sheet iron clippings and tin cans. The size and density of bundles are especially attractive for charging in electric furnaces.

The three models of this design provide an ample range to meet all requirements.



Size of Charging Box	33" x 33" x 24"	Vickers Vane Type Rotary Pump	2,000 lbs. per sq. in.
Average number of bales per hour	60 - 70	Space Required	10' x 12'
Size of Electric Motor	50-Hp. 1200 Rpm	Shipping Weight	20,000 lbs. (approx.)

AVERAGE SIZE OF FINISHED BALE

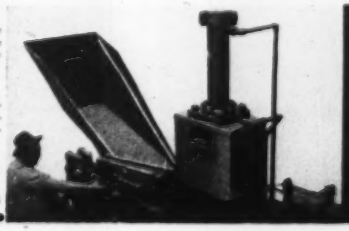
NF-40 ..... 5" x 5" x 15"
NF-50 ..... 5" x 7" x 15"
NF-80 ..... 8" x 8" x 15"

AVERAGE WEIGHT OF BALE

NF-40 ..... 40-60 lbs.
NF-50 ..... 50-70 lbs.
NF-80 ..... 80-100 lbs.

AVERAGE TONNAGE PER HOUR

NF-40 One and one-half tons
NF-50 Two tons
NF-80 Two and one-half tons



HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA

Stress rack assembly used to crack, produce failures in partially embrittled blades. Tests strips 12 inches long, ½-inch wide, 0.060-inch thick

which was heat treated to remove the hydrogen showed an analysis of 3.2×10^{-6} grams of gas per gram of blade material.

Low values may be due to a loss in hydrogen from the time of cutting the blades to time of their analysis. Initial diffusion of hydrogen out of an embrittled specimen is extremely high within the first few hours.

Prevention of Embrittlement — Blade cracking due to embrittlement can be eliminated if hydrogen can be kept out. To show value of paint systems in preventing embrittlement, sample 410 strips were painted with a vinyl coating and processed in a HCl and SeO_2 solution, then annealed two hours at 990°F. After three hours in acid, angle of bend was recorded at 175 degrees. Comparing this value with those obtained with unprotected stock, angle of bend to break was approximately 16 degrees at the end of 40 minutes. Painting decreases susceptibility to embrittlement as it prevents corrosion on the surface of the strip. Consequently there is no available hydrogen to diffuse into the metal.

Tests indicate that blades only partially embrittled and not cracked will fail if external pressure is applied of sufficient magnitude to exceed tensile strength of the material. It is not necessary to have residual stresses in a blade before it fails. Residual stresses present in blades because of edge grinding are not sufficient in themselves to produce failures as found in the field.

Metal Furniture Featured

Royal Metal Mfg. Co., Chicago, offers a catalog featuring the company's line of furniture for 1952.

Also included in the book is a section devoted to sectional shelving, cabinets and metal shop equipment. Copies will be sent on request to the company, 173 N. Michigan Ave., Chicago 1.

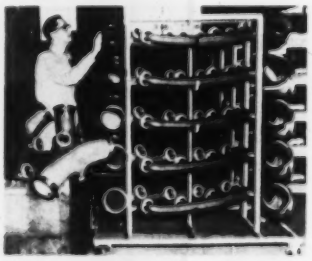
Custom-Tailored Carts Move Parts Efficiently

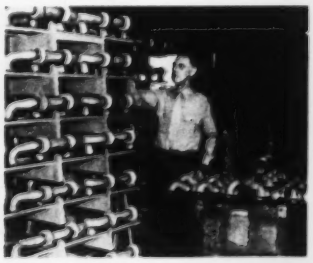
MODERN design applied to materials handling equipment at Ryan Aeronautical Co., San Diego, Calif., results in more efficient movement and storage of finished parts, and speeded production. In redesigning materials handling equipment three factors were considered: Protection of parts from damage or marring; conservation of factory space; ease of handling.

Previous method of transporting parts was rectangular tote carts. Same cart used for collecting scrap also moved valuable finished parts to the shipping department. Method of loading was strictly up to an individual's ingenuity. Odd-shaped parts had to be dovetailed as well as possible to fit inside the cars. Bulky exhaust system parts were placed on the top, overhanging on both sides.

Parts now get handled in carts custom-tailored to fit them. Carts are engineered to accommodate a maximum of parts in a minimum of space. Some, for the General Electric J-47 engine struts have a bird-cage appearance. Others are series rubber encased supporting hooks that look similar to a clothes tree.

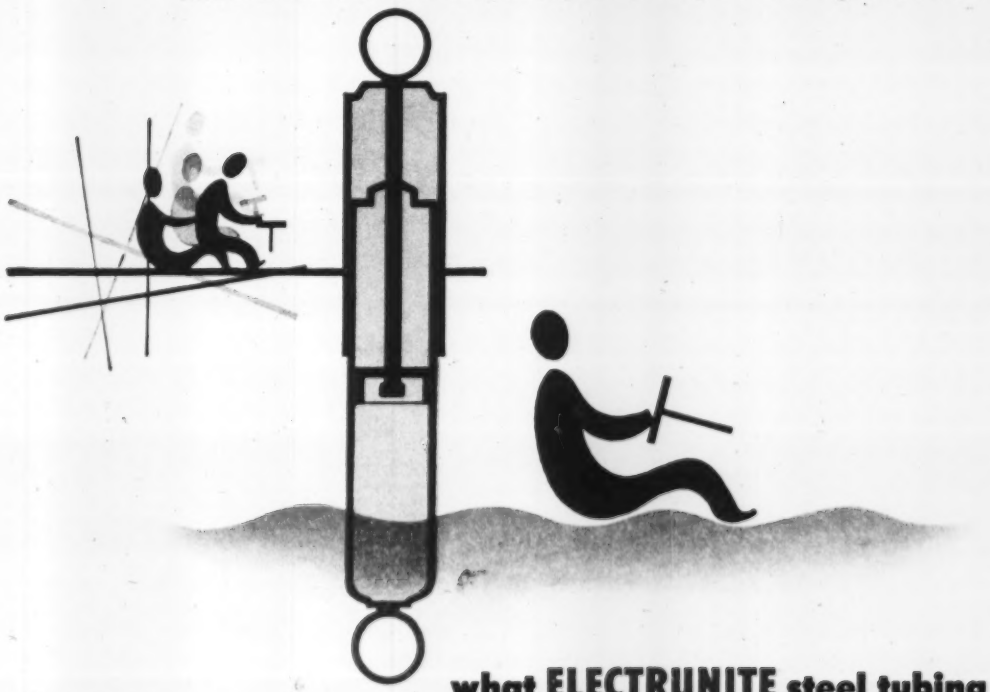
Each piece has its own compartment. Surfaces do not rub against each other. Yet there is plenty of space economy. One "bird cage" holds 204 J-47 struts, several times more than a tote cart occupying almost equivalent floor space. New racks can be pulled in trains by a small conveying truck.





Space and time savers are these custom-tailored conveying racks for odd-shaped aircraft parts produced at Ryan Aeronautical Co. Advantage is evident upon comparison with quantity of parts held by former method of conveyance, conventional tote carts. Separate compartments protect parts against jostling

another case where welded steel tubing does the job best . . .



what ELECTRUNITE steel tubing did for shock absorber manufacturers

it can do for you . . .

Today's airplane-type automobile shock absorbers are high-precision devices. They give years of service with practically no maintenance or attention. What's more, they cost . . . and weigh . . . much less than the old-style shock-absorbers that required new webbing or new springs or replacement all too often.

Today's hydraulic shock absorbers use large quantities of ELECTRUNITE Steel Tubing . . . the welded steel tubing that provides plenty of surplus strength to stand rough service under severe loads for many types of devices.

The extremely close ID and OD tolerances of ELECTRUNITE Steel Tubing enable manufacturers to use it without expensive preliminary reaming or finishing. Surfaces are clean, concentric, free from defects. It's produced in carbon, alloy, and stainless grades, in a wide range of sizes, wall thicknesses, and lengths.

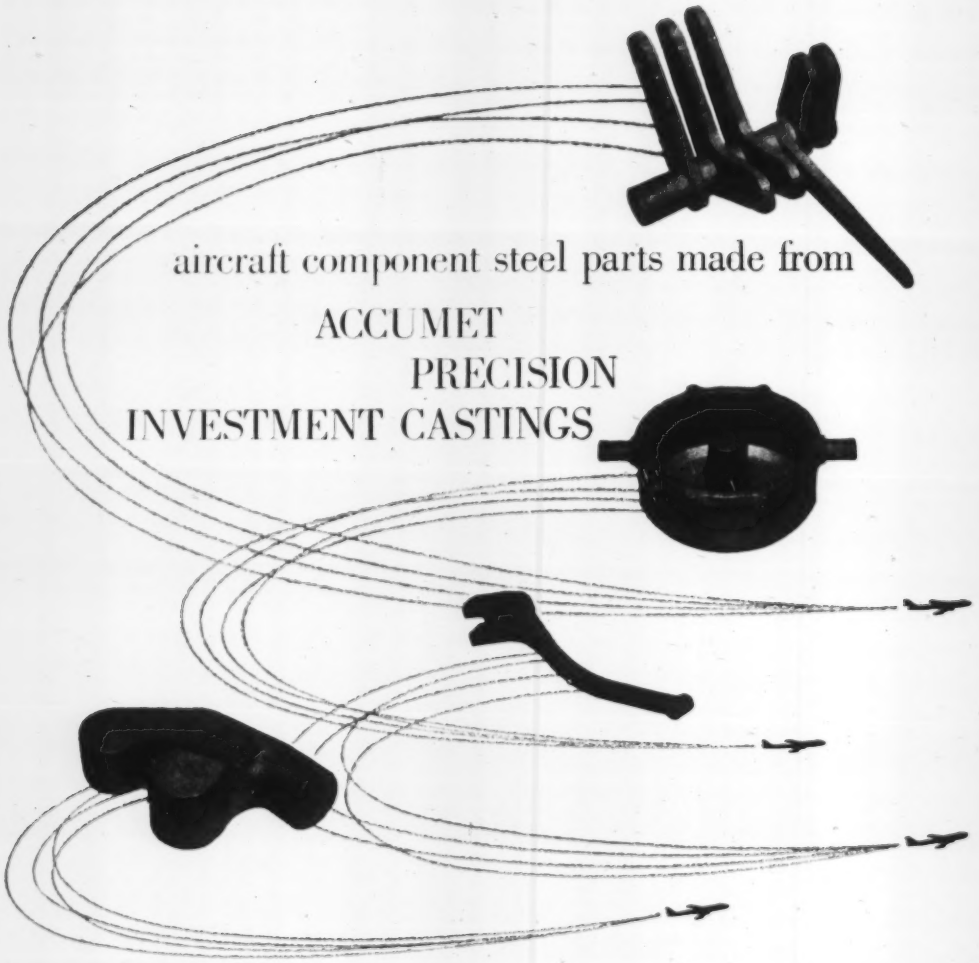
If you'd like more information about how ELECTRUNITE Steel Tubing is helping a wide variety of manufacturers and products, write to:

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
224 EAST 131st STREET • CLEVELAND 8, OHIO

Made by the producers of
ELECTRUNITE PRESSURE TUBES
The "*Original*" ELECTRIC-WELDED BOILER TUBE

REPUBLIC STEEL

ELECTRUNITE TUBING



aircraft component steel parts made from ACCUMET PRECISION INVESTMENT CASTINGS

The pictured castings are currently being used to produce such important aircraft accessories as fuel injectors and regulators, carburetors, landing gear door latch mechanisms; rocket release mechanisms and radar equipment. Cast to close tolerances with smooth surface finish, expensive machining operations are avoided—resulting in saving of valuable time, reduction in cost and eliminating the need for hard-to-get machine tools. Also *Accumet Precision Investment Castings* permit the use of higher alloyed steels that are difficult or impossible to machine or forge, thus increasing the life or performance of the component parts.

ENGINEERING SERVICE AVAILABLE

Crucible engineers and metallurgists are available to assist you in solving your design or production problems by the application of these Accumet Precision Investment Castings . . . that are playing such an important part in our National Defense Program.

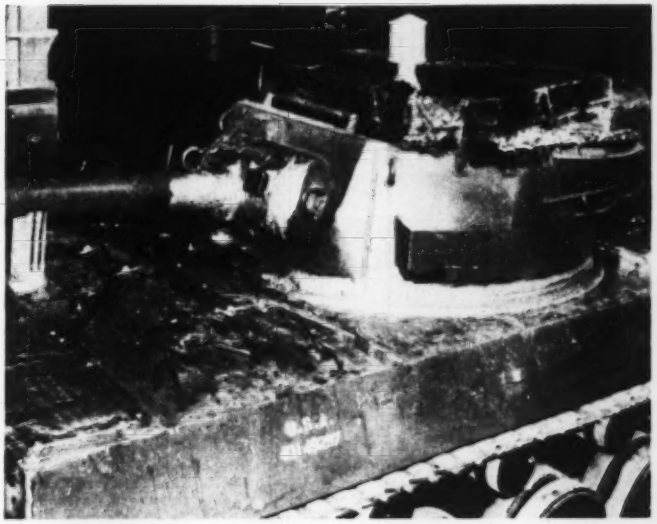
CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

ACCUMET PRECISION CASTINGS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



M4 series medium tank sealed ready for storage. Ventilator on top allows inside to breathe. Aluminum paint applied by brushing covers foil and mastic

Military Vehicles Sealed for Storage

Tests show laminated seal with aluminum foil keeps moisture out. New seal lasts longer. Ventilator prevents condensation and evaporation inside hulls

SEALING military vehicles for storage and shipment to exclude moisture presents two problems: Free water eventually seeps in through the seal and moisture present in the vehicle at sealing condenses and evaporates.

Experience shows that the average vehicle processed with shellac, tape and mastic as the sealing agents, requires some measure of continuous inspection and reworking in the field. After four to eight months exposure, aging and delamination of sealing materials required reworking of all taping and closure to provide the minimum protection necessary to prevent free water from gaining access to interior compartments and prevent rust, rot and corrosion.

Newer Method—In 1948 representative vehicles including tanks, trucks and armored cars were sealed using bituminous mastic and aluminum sheet foil with a top coating of aluminum paint containing asbestos fiber. Temperature and humidity indicators were installed in several of the hull type vehicles and readings were taken periodically. Although the frequent inspections of the vehicles disclosed that no free water was entering the vehicles, the problem remained of moisture present in the vehicle when it was sealed.

Ventilating the vehicles was accomplished by using the drain plug openings and adapting a ventilator to the periscope opening of hull type vehicles. Continuous inspection over a period of eight months showed no evidence of free water or further condensation inside the vehicles. They were opened at intervals and thoroughly inspected for signs of deterioration or corrosion. The vehicles were completely dry and the condition of the aluminum foil seals was excellent. After completion of the studies and tests the Ordnance Corps adopted the method and issued instructions directing its use.

Plywood Bridges—The adhesive mastic is thoroughly mixed before using and applied by brushing around the openings to be sealed. The mastic is allowed about 10 minutes to become tacky. The aluminum foil is rolled or pressed into the mastic. Sharp projections likely to cause punctures are covered with additional thicknesses of foil prior to sealing. Wide spans or gaps are bridged with plywood or some other frame and the foil is laid over. Edges of the foil do not extend beyond the mastic coating. The foil is smoothed over by hand or with a small wooden or rubber roller to force out air bubbles from between the foil and the mastic.

Aluminum paint coating is applied by brushing over the entire surface of the aluminum foil. Ventilators and adaptors which are used on all tank and tank-like vehicles in storage are installed in the periscope opening at the highest point of the vehicle. Prior to the installation of the ventilator and adaptor, the periscope and its components are removed and placed inside.

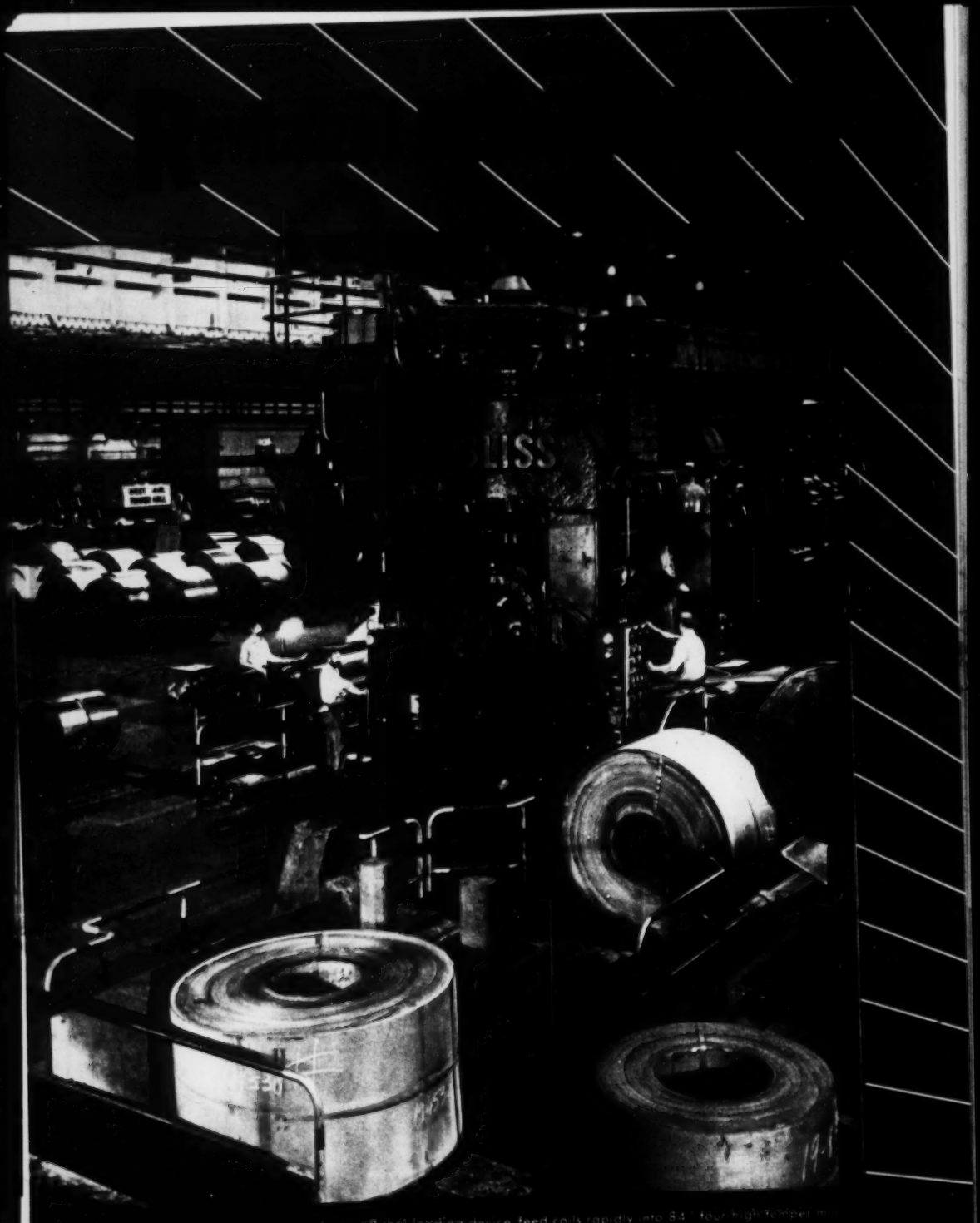
Covers are built and sealed on all open type vehicles. Interior compartments of vehicles being prepared for export shipment are protected with desiccants. All exposed aluminum foil seals and closured on vehicles being prepared for export are painted with lusterless paint immediately prior to shipment.

Entries Accepted for Award

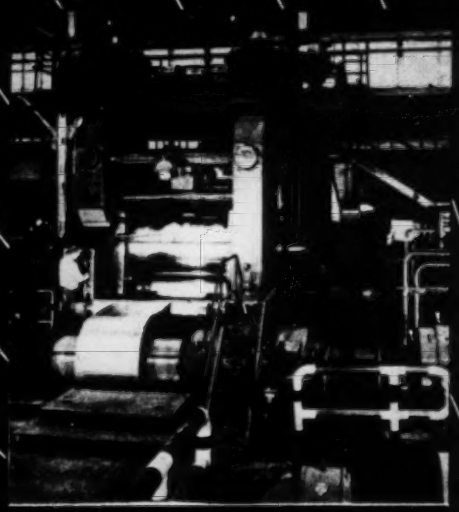
The annual Doehler award will be given in September at the meeting of the American Die Casting Institute. Selection will be made by June 30. Award will consist of a suitable plaque and a cash award of at least $500.

Award is made for the outstanding contribution to the advancement of the die casting industry or to the art of die casting. Any individual, group of individuals, technical or scientific society or committee thereof shall be eligible whether or not engaged in the die casting business and whether or not in the employ of a member of the American Die Casting Institute.

Nominations for the award and supporting papers or other material will be received until Apr. 30. Entries should be addressed to the institute, Award Committee, 366 Madison Ave., New York 17.

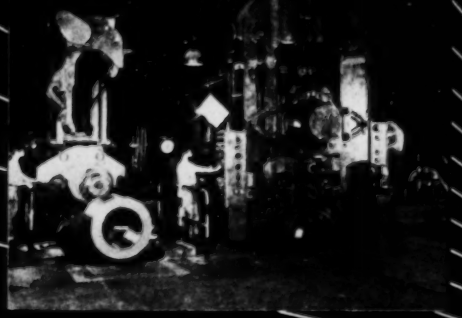


Entry conveyor, special up ender, and pay off reel loading device feed coils rapidly into 84" four-high tandem m



Massive reel to pay off 74,000 lb. coils is shown on entry side of the mill.

Operator actuates controls to accelerate mill from threading speed to 2000 fpm in eight seconds.



Increased Horsepower and Improved Coil-handling Equipment Raises Production Standards at Gary Sheet and Tin Mill

Yesterday's equipment, even when well designed, is incapable of keeping pace with current production requirements. Recognizing this, engineers at U. S. Steel Company's Gary Sheet and Tin Mill, asked Bliss to recommend equipment and methods to utilize full production capacity of one of their four-high temper mills. Here's how Bliss engineers transformed a 20-year-old mill into a high-speed, modern installation:

- Bliss designed auxiliary reels to handle coils of unprecedented weight—74,000 lbs. in 74" widths.
- Bliss re-powered the mill to deliver at 2000 fpm, and permit faster acceleration/deceleration. This faster pickup—permitting acceleration from threading speed to 2000 fpm in eight seconds—is a significant production step-up.

Engineering new and added life into old equipment is practical and effective. Bliss can point to many successful achievements of this type in steel, brass and aluminum mills. So whether you want to revitalize the old or create the new, it will pay you to consult Bliss. Start now by writing for your copy of our 52-page brochure. It shows how Bliss designed many outstanding installations.

E. W. BLISS COMPANY, *General Office:* CANTON, OHIO
ROLLING MILL DIVISION: SALEM, OHIO
E. W. Bliss (England) Ltd., Derby, England
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

...nery... **It's Bliss**

What Boron Steels to Use—And Why

When selecting boron alloy steel substitutes choose them on basis of minimum hardenability desired in product. It is not necessary to duplicate the entire hardenability band

By H. B. KNOWLTON
Supervisor, Materials Engineering
International Harvester Co.
Chicago

BORON alloy steels offer one of the most attractive means of conserving alloys. Boron addition produces greatest increase in hardenability in proportion to per cent of material added.

These steels may be substituted for more conventional alloy steels for automotive parts, which are heat treated for strength and toughness, and some surface hardness. Boron alloy steel substitutes should be selected on the basis of duplicating minimum hardenability to a distance on the Jominy specimen corresponding to cooling speed of the critical section of the production part.

It is not always necessary to duplicate the entire hardenability band. It is safer to calculate minimum strength obtainable at point of highest cross section stress on basis of minimum hardness obtainable after a production quenching and drawing treatment, rather than on the basis of tensile specimens taken from the center, or half radius, positions. Similarly, minimum physical properties representing the bottom of the expected hardenability band for the boron steel, are more reliable than the most elaborate of service tests made upon parts manufactured from lots of steel representing the middle or upper portion of the hardenability band.

Failure Prevention—It is imperative that steel selected shall have sufficient toughness to prevent brittle types of service failures—to prevent failure from originating in a brittle manner. Practically all fatigue failures show a small area representing the last portion to break, which has the characteristic appearance of brittle fracture.

For any given part a certain minimum toughness is required to prevent brittle origin of failure. Higher degrees of toughness may not be of any greater value. The minimum toughness required for successful performance of many automotive parts is frequently lower than may be supposed, because the designer has avoided sharp notches and other stress raisers. It is sufficient to duplicate the minimum toughness which has been satisfactory in the past.

Much higher degrees of toughness are required for projectiles, armor, or any other parts which are subjected to application of stress at ballistic velocities. Some writers stress that boron steels may show less toughness than other alloy steels, under conditions of slack quenching or high tempering. Determine whether final properties are adequate for actual application.

Other Solutions—Use of boron steels is only one approach to the problem of alloy conservation of alloying elements. The new 8000 and 8100 series steels without boron have advantages for some applications. Furthermore, plain carbon steels, such as 1045 and 1050, with the help of induction hardening, torch hardening, and special heat treatments involving drastic quenching, have been found very valuable for certain applications.

In some cases, performance tests have shown the specially treated carbon steels to be equal, or superior, to the older alloy steels. The control of residual stress set up by heat treatment is one of the most important factors influencing the service performance of finished parts. Austempering, martempering, and the special treatments just mentioned, all have an important effect upon the residual stresses left in the steel.

Case Hardening Problems —

Chemical Composition Limits, per cent

Grade	C	Mn	Si	Ni	Cr	Mo	V
T8 14B35	0.33/0.38	0.75/1.00	0.20/0.35	.....	.....	.....	.....
T8 14B50	0.48/0.53	0.75/1.00	0.20/0.35	.....	.....	.....	.....
14B52	0.47/0.55	1.20/1.55	0.20/0.35	.....	.....	.....	.....
T8 40B37	0.35/0.40	0.70/0.90	0.20/0.35	.....	.....	0.08/0.15	.....
T8 43BV12	0.08/0.13	0.75/1.00	0.20/0.40	1.65/2.00	0.40/0.60	0.20/0.30	0.03 min.
T8 43BV14	0.10/0.15	0.45/0.65	0.20/0.35	1.65/2.00	0.40/0.60	0.08/0.15	0.03 min.
T8 46B12	0.10/0.15	0.45/0.65	0.20/0.35	1.65/2.00	.....	0.20/0.30	.....
50B15	0.12/0.18	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
50B20	0.17/0.23	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
50B30	0.27/0.34	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
50B35	0.32/0.39	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
50B37	0.34/0.42	0.70/1.00	0.20/0.35	.....	0.20/0.40	.....	.....
50B40	0.37/0.45	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
50B44	0.42/0.50	0.70/1.00	0.20/0.35	.....	0.35/0.60	.....	.....
T8 50B46	0.43/0.50	0.75/1.00	0.20/0.35	.....	0.20/0.35	.....	.....
50B49	0.47/0.55	0.70/1.00	0.20/0.35	.....	0.20/0.40	.....	.....
T8 50B50	0.48/0.53	0.75/1.00	0.20/0.35	.....	0.40/0.60	.....	.....
T8 50B60	0.55/0.65	0.75/1.00	0.20/0.35	.....	0.40/0.60	.....	.....
80B15	0.12/0.18	0.60/0.90	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B17	0.14/0.20	0.60/0.90	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B20	0.17/0.23	0.60/0.90	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B25	0.21/0.28	0.60/0.90	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B30	0.27/0.34	0.55/0.80	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B35	0.32/0.39	0.65/0.95	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
T8 80B37	0.35/0.40	0.75/1.00	0.20/0.35	0.20/0.40	0.20/0.35	0.08/0.15	.....
80B40	0.37/0.45	0.70/1.00	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B45	0.42/0.50	0.70/1.00	0.20/0.35	0.20/0.40	0.15/0.35	0.08/0.15	.....
80B50	0.47/0.55	0.70/1.00	0.20/0.35	0.20/0.40	0.25/0.50	0.08/0.15	.....
80B55	0.50/0.60	0.70/1.00	0.20/0.35	0.20/0.40	0.30/0.55	0.08/0.15	.....
80B60	0.55/0.65	0.70/1.00	0.20/0.35	0.20/0.40	0.30/0.55	0.08/0.15	.....
81B35	0.32/0.39	0.70/1.00	0.20/0.35	0.20/0.40	0.30/0.55	0.08/0.15	.....
T8 81B40	0.35/0.43	0.75/1.00	0.20/0.35	0.20/0.40	0.35/0.65	0.08/0.15	.....
81B45	0.42/0.50	0.70/1.00	0.20/0.35	0.20/0.40	0.30/0.55	0.08/0.15	.....
81B50	0.47/0.55	0.75/1.00	0.20/0.35	0.20/0.40	0.35/0.60	0.08/0.15	.....
T8 94B17	0.15/0.20	0.75/1.00	0.20/0.35	0.30/0.60	0.30/0.50	0.08/0.15	.....
T8 94B20	0.17/0.22	0.75/1.00	0.20/0.35	0.30/0.60	0.30/0.50	0.08/0.15	.....
T8 86B45	0.43/0.48	0.75/1.00	0.20/0.35	0.40/0.70	0.55/0.75	0.08/0.15	.....

NOTE 1. These steels can be expected to have 0.0005 per cent minimum boron content.

NOTE 2. The phosphorus and sulphur limitations for each steelmaking process are as follows:
Basic electric furnace—0.025 maximum per cent
Basic open hearth —0.04 maximum per cent
Acid electric furnace —0.05 maximum per cent
Acid open hearth —0.05 maximum per cent

NOTE 3. Minimum silicon limit for acid open hearth or acid electric furnace alloy steel is 0.15 per cent.

NOTE 4. Small quantities of certain elements are present in alloy steels which are not specified or required. These elements are considered as incidental and may be present to the following maximum amounts: Copper, 0.35 per cent; Nickel, 0.25 per cent; Chromium, 0.20 per cent and Molybdenum, 0.06 per cent.

NOTE 5. 8000-series steels have same compositions as 80B00 steels except that 8000 steels do not have boron.

From data presented by the author at the SAE annual meeting, Detroit, January, 1952.

Century 1 TO 400 H.P. MOTORS

Choose From These Many Types To Fit Your Job

DEPENDABLE CONSTRUCTION . . . Plus PROPER SELECTION MINIMIZE SHUTDOWNS

It's easy to select the proper electric motor for your job from Century's complete line — from 1/8 to 400 horsepower. A wide range of types and kinds are available to satisfy all popular requirements. They are carefully designed, built and tested to assure maximum performance throughout their long life.

Here are examples of Century's line of INTEGRAL HORSEPOWER motors.

Polyphase

TYPE SC—Open Drip proof General Purpose Motor. Meets the needs of most installations where operating conditions are relatively clean and dry.

TYPE SC—Splash proof. Supplies protection where plants must be washed down. Keeps out all falling or splashing liquids—rain, snow, sleet, etc.

TYPE SC—Totally Enclosed Fan Cooled. Protects against dusts, mist, oil, fog. Inner frame protects vital parts of the motor, seals out harmful matter.

TYPE SC—Explosion proof. Protects life and property in atmospheres charged with explosive dusts or gases.

TYPE SR—Wound Rotor. Open Construction. Ideal for applications requiring low starting current with high starting torque, reversing or adjustable speed.

TYPE SR—Wound Rotor Splash proof. Same electrical characteristics as motor shown above. In addition, gives adequate protection against falling and splashing liquids.

Single Phase

TYPE RS—Repulsion Start Induction, Open Construction, Single Phase Brush Lifting Motor. Combines high starting torque with low starting current.

TYPE RS—Splash proof. Same advantages as open construction, plus protection against splashing and falling liquids.

TYPE CSH—Capacitor Start Induction, Single Phase Motor. Suitable when high starting torque with normal starting current is satisfactory.

TYPE CSH—Splash proof. Same advantages as motor shown above, plus protection against falling and splashing liquids.

Direct Current

TYPE DN—Direct Current Motors. Suitable for use where direct current is available, or its use desirable.

TYPE DN—Direct Current, Splash proof.

TYPE SY—Synchronous. Suitable for continuous operation at a uniform load for power factor correction.

In addition to a complete line of integral horsepower motors, Century offers fractional horsepower motors, gear motors, generators, AC and DC motor generator sets.

For a long life of satisfactory performance, specify Century motors for all your electric power requirements.

CENTURY ELECTRIC COMPANY, 1806 Pine Street, St. Louis 3, Missouri • Offices and Stock Points in Principal Cities

Boron alloy steels are being used satisfactorily for certain case hardened parts, particularly case hardened gears. More difficulties have been encountered, however, with case hardened parts than with all types of heat treated parts. The addition of boron has the greatest effect upon the hardenability of the core, and the least effect upon the hardenability of high carbon portions of the case, particularly any portion containing 0.90 carbon or above. Consequently, some difficulties have been reported with failure of the surface of large sections to harden properly, while the high hardenability of the core has sometimes caused excessive distortion.

Lowering the carbon content of the steel is sometimes beneficial, but in some cases has caused difficulties with machinability due to the unusual softness of these very low carbon steels.

On the whole, the work of the last year in particular, has shown that conservations of alloys are possible, and that with sufficient study we should be able to produce many automotive parts with plain carbon or very low alloy steels, and at the same time guarantee successful performance of the product.

Metallic Lubricants

Molybdenum disulphide, copper-lead alloys combat bearing surface wear factor

By N. C. AMEN
Technical Director
Imperial Oil & Grease Co. Inc.
Los Angeles

SOME metal elements have been known for many years to have a lubricity value. Not until recently were these metals studied for their individual as well as collective contribution in maintaining bearing surface areas against wear. Petroleum products serve as a vehicle or binder of these elements.

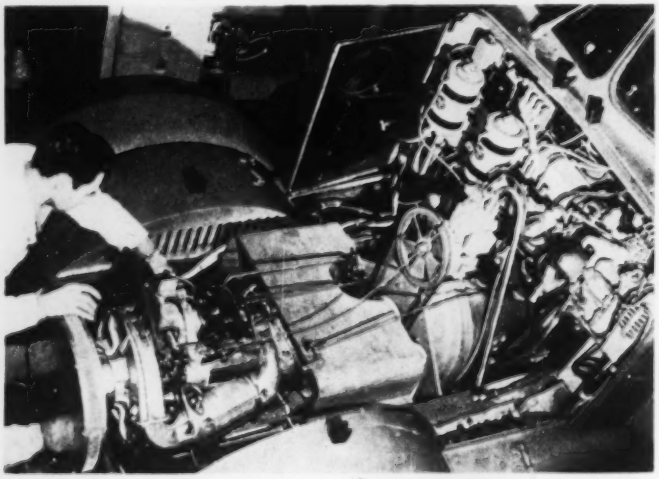
Particle Lubricity—Molybdenum disulphide (MoS_2), Marco-alloy (copper lead alloy), Marco-nite (silicone type material), and other combined solids developed for the purpose of creating a more stable lubricating compound are now being used in this "wear factor." Particle sizes of all metallic solids differ for the specific function of filling in varied dimensional pores in metal surfaces.

Each particle has certain qualities of lubricity in its own right. Through the proper combination of metals and compounds, each complements and fortifies the other in service. Controlled action is possible, and excessive build-up of solids at pressure points is inhibited.

In producing finished products, it is necessary that solids be placed in a suitable base material that will resist water, heat, and severe agitation. This carrier must be both chemically and thermally stable over long periods in storage. Combined solids will resist in large part, solvents, chemicals, most acids, water, heat, and cold conditions.

Vacuum Homogenized—Mechanics of mixing and producing finished products are divorced from conventional grease-making practice. Instead of using vats and paddle mixing methods, a controlled vacuum pressure process brings about a more complete homogenization of the product, which is important in stabilizing against moisture, air and thinnage in operational service. No curing time is required before use. Regardless of temperatures imposed in service it will never melt.

Conforming to the ASTM code of viscosities, metallic lubricants are produced to comply with specifications set forth by manufacturers of equipment. Outstanding results have been realized with the use of this material in friction and antifriction bearings, as well as in power transmission equipment. Because of impregnation and high extreme pressure value, the product serves in speed reducers, transfer cases, and in most enclosed gear boxes. Conventional equipment is suitable for dispensing metallic lubricants.



Bonded Flexible Coupling Is Sealed for Delivery

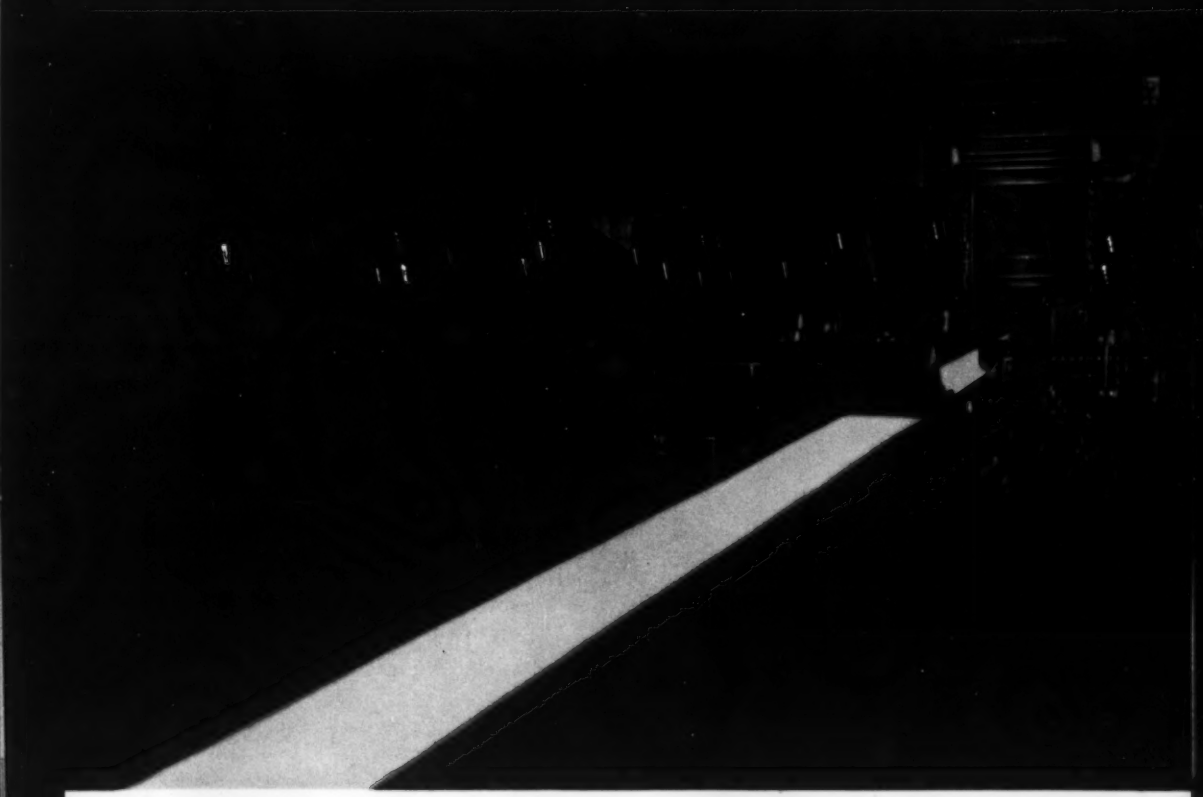
Ample power to pull its trailer is delivered from this experimental Kenworth gas turbine engine through shear-type bonded flexible coupling. Flexible mounting system protects the engine from frame twist stress. Both mounting and coupling were made for the Boeing Airplane Co. test tractor by Lord Mfg. Co., Erie, Pa.

Motor Line Described

Design and application features of Life-Line motors are described in a booklet available from Westinghouse Electric Corp., Pittsburgh. Motor applications in industry are illustrated and separate sections describe the special construction of motor frames, end brackets, stators, rotors, and bearings. Standard and special mountings and enclosures also are described. Motors are available in ratings up to 700 hp. Copies of booklet B-4731 will be sent on request to the company, Box 2099, Pittsburgh 30.

Continental

HIGH LIFT SLABBING MILL



Complete Rolling Mill Installations:

BLOOMING MILLS • STRUCTURAL MILLS • RAIL MILLS
BILLET MILLS • ROD MILLS
BAR MILLS • MERCHANT MILLS • SLABBING MILLS
UNIVERSAL MILLS • PLATE MILLS
HOT STRIP MILLS • COLD STRIP MILLS • TEMPER MILLS
ROLL LATHES • SPECIAL MACHINERY

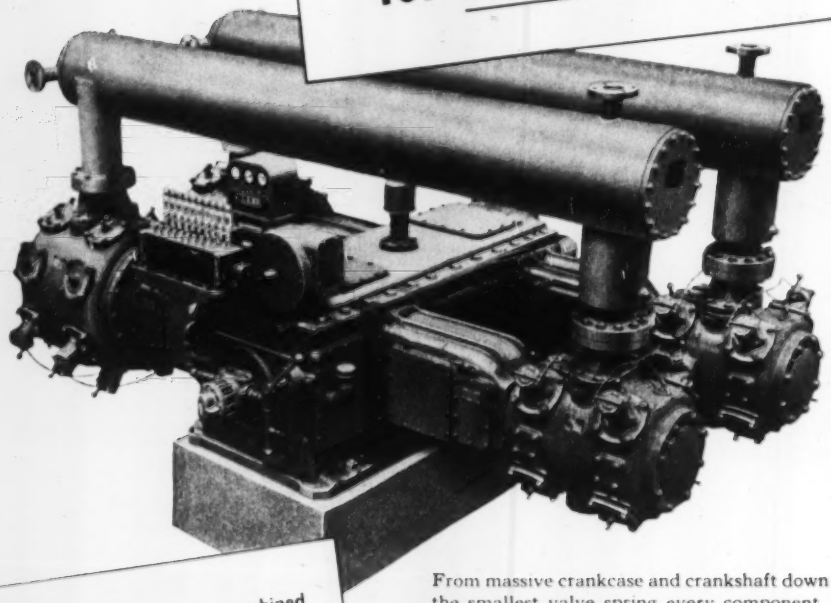
CASTINGS—carbon and alloy steel from 20 to 250,000 pounds

ROLLS—iron, alloy iron and steel rolls for all types of rolling mills

CHICAGO • PITTSBURGH

Plants at: *East Chicago, Ind.* • *Wheeling, W. Va.* • *Pittsburgh, Pa.*

precision built
for extra long life



- Extra rigid, accurately machined crankcase assures permanent alignment.
- Massive, one-piece, forged steel crankshaft ground to precise tolerances.
- Modern, automotive type, precision bearings.
- Micro-bored connecting rods.
- Extra rugged, heavy duty compressor cylinder valves precision built for long, hard service.

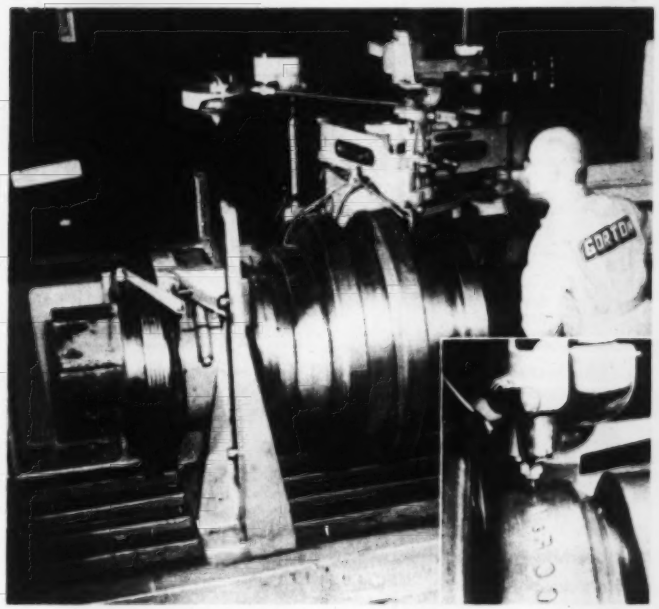
From massive crankcase and crankshaft down to the smallest valve spring, *every* component of Clark Balanced/Opposed Air Compressors is machined and finished to infinitely accurate tolerances.

Such unequaled, precision construction — *plus vibrationless operation through perfect balance* — are your assurance of extremely long life with a minimum of maintenance. Clark Balanced/Opposed, Motor-Driven Air Compressors are designed and built to serve *indefinitely!*

For information on this truly modern line of air compressors, covering a range of 150-4500 bhp, request Bulletin 118.

CLARK **balanced/opposed compressors**

CLARK BROS. CO., INC. • OLEAN, N. Y.
One of the Dresser Industries
SALES OFFICES IN PRINCIPAL CITIES THROUGHOUT THE WORLD



Installed at Colorado Fuel & Iron Corp. mill, Pueblo, Colo.., machine cuts on 50 Rockwell steel. Inset shows closeup of cutter in position over workpiece

Heat-Treated Rolls Engraved Automatically

Operating on a tracer-controlled principle machine will cut on curved roll surface from flat master plate. Two sizes of machines offer a range of capacities

MILLING and engraving surfaces of large rolls heat treated to 50 Rockwell C is possible with a machine built by George Gorton Machine Co. The tracer-controlled pantograph engraver utilizes flat copy or master patterns. Rolls 36 inches in diameter and up to 12 feet long can be handled.

Machine was designed for engraving letters and numerals on rolls used in forming I-beams, railroad rails and reinforcing rods used in concrete work. Roll shafts at either end are cradled on two free-running rollers. Hand crank operates an indexing ring to turn roll to any desired position. Motorized drive or mechanical indexing fixture can also be furnished.

Openings in the holding brackets enable machine to accommodate roll shafts of varying diameters. Pantograph moves longitudinally and transversally on scraped dovetail ways. If an all-over design is required a segment of the complete design is made. Indexing the roll to successive new positions creates the continuous pattern.

Reduction ratios cut the amount of effort needed to trace the master. A forming guide mounted above the spindle and shaped to conform to the curvature of the roll forces the spindle to follow the contour of the roll.

Bolt Saves Repair Time

At a major air base blind lockbolts made by Huck Mfg. Co., Detroit, accomplished a list of repairs in a total of nine hours. Conventional methods would take 668 hours to do the same jobs. In one particular case stress plates were attached to fuel web spars. Time for this job is estimated at 60 man-hours using conventional repair methods. Additional hours would be required to drain, clean out, flush, ventilate and install protective mats on the bottom of the tanks. This requires from 44 to 120 hours per plane. Using lockbolts one man works from the outside of the tank and does the complete job in one hour.

The bolts are approved by the U. S. Air Force and the Navy Bureau of Aeronautics for use in aircraft structures.

Water Tests Improved

Patents are awarded to Dr. Gerold Schwarzenbach, Swiss scientist, for his water-hardness tests according to the Hagan Corp., Pittsburgh. His method for total hardness determination is accurate within one part per million. Modified procedures, reagents and equipment are available which make the basic method convenient for field use.

Both total hardness and hardness due to calcium alone can be quickly determined by the new test. Magnesium can be determined by difference. The method for total hardness is especially sensitive to small amounts.

The endpoint of a test for total hardness is sharp and readily detected so the human factor is practically eliminated. There is no limitation on sample size other than economy of operation, since no scum or salt effect can obscure the endpoint.

Porous Bearings Discussed

Gaskets made of scrap neoprene are used on high cycle nut runners at Texas Engineering & Mfg. Co. Inc., Dallas, to prevent shorting out of switches and reduce a safety hazard.

Metal chips were being drawn into the motor housing by the armature fan and thrown through a ½-inch hole left for switch wires, into the switch box. Short circuits resulted, often fusing the switch box to the motor housing. Operators reported electrical shock and often suffered burns.

By drawing the wires through small holes in a scrap rubber gasket placed between switch and motor housings, metal chips could be prevented from entering the switch box. Since installation of the gaskets there have been no burned-out switches reported and no operators have reported shock.

Blast Furnace Practice

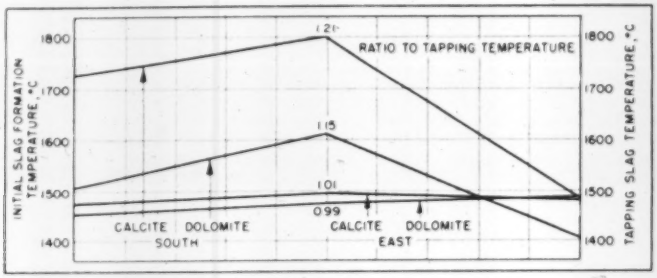


Fig. 13—Thermal effects of South and East operations using two fluxes

VII—Comparative Values of Fluxing Stones

Comparison of operating conditions in the South and East areas indicates that economy of calcite and dolomite fluxes is determined by the need for chemical constitutents and not alone by the silica-calcium ratio

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

CALCITE and dolomite fluxing stones either are desirable or undesirable depending upon the need for their respective chemical constituents. Throughout the blast furnace industry it has been customary to consider calcium (CaO) and magnesium (MgO) oxides equal in chemical activity as a base fluxing agent for acid gangue of the burden. The custom is justified because of successful furnace operation in all producing districts.

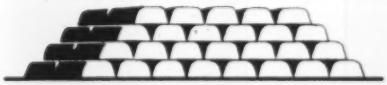
McCaffery[3] was first to recognize the effect of magnesia minerals on slag physical properties. His findings on magnesia minerals, and those of the Bureau of Mines on zones of chemical reaction when applied to the thermal effects at different stages of slag formation, indicate their thermal effect is of equal, or even greater, importance to blast furnace operating economy than their effect on the physical properties.

Fluxing Practice Reversed—Data of the thermal balance comparison show South used dolomite and East used calcite fluxing stones. To indicate the thermal effects in these two operations in event the fluxing stones had been reversed the theoretical temperature of slag at different stages of formation was calculated for comparison, all other conditions of the respective operations being unchanged. Condensed data of the calculations are shown in Table XIV and graphically in Fig 13.

A theoretical study of the thermal effects from slag chemical and mineral composition indicates that a tapping slag of the South composition would not be favorable to the concentration of heat in the lower bosh of the furnace. Calculation of the South slag through its various stages of formation substantiates this theory in that the temperature of the initial stage would tend to cause an excessive drainage of heat from the upper bosh rather than to conserve it in the lower bosh. However, because of a high percentage of gangue in the ore and of ash in coke, and unfavorable ratios of slag-forming constituents to each other, the thermal conditions indicated with the dolomite calculation while not good are much better and more desirable than they are with the calcite calculation. With dolomite the initial formation temperature for slag is 104°C or 7.4 per cent higher than the tapping slag temperature, but with calcite stone it is 244°C or 16.4 per cent higher than the tapping slag. The effect of this difference in temperature on the gas velocity through the furnace shaft is obvious, and definitely for South burden materials, the thermal conditions created with dolomite are more favorable than they are with calcite stone. South tapping slag is neutral in its acid/base ratio but when classified by tetrahedron it is in basic tetrahedrons in all stages of formation. Temperature conditions with calcite stone are high because of the high percentages of calcium orthosilicate in the stages of formation preceding the tapping stage. Fig. 13 indicates that calcite stone would create a hotter hearth than dolomite stone but the advantage normally to be expected from it would be nullified by the objectionable thermal condition created in the upper bosh.

Conditions Are Contrary—With low gangue content of East ores and the low ash coke, conditions for forming slag are directly opposite to South. With the preferred raw material conditions the relation of the initial slag formation

[3] Year Book (1931) AIME. Richard McCaffery and Co-workers.



MORE THAN

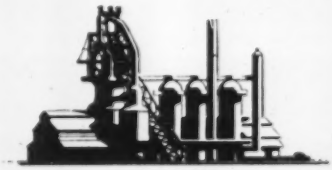
A TON AND A QUARTER

OF PIG IRON

EVERY MINUTE

TWENTY-FOUR HOURS

A DAY



FROM ONE

McKEE-BUILT

BLAST FURNACE

THAT'S an average of 1807 tons a day and it adds up to a new world's record of **56,010 tons in one month** . . . more than any one blast furnace ever produced in a single month in the history of the industry.

It takes four essentials to make a pig-iron production record—good top management, which provides superior operators, good raw materials and a McKee-built blast furnace.

Eleven of the twelve modern records established since 1931 have been made by McKee-designed blast furnaces. This quality of engineering, which consistently builds record-breakers, is one of the reasons good top management has been calling on McKee for blast-furnace and steel plant design and construction for almost half a century.

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

McKee Engineering

Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio. *New York Office:* 30 Rockefeller Plaza, New York 20, N.Y. • *Washington Office:* 1507 M Street, N. W. Washington, D. C. • *England:* The Iron and Steel Division of Arthur G. McKee & Company is represented by Head, Wrightson & Company, Ltd. *District Engineering Offices:* Union, New Jersey and Tulsa, Oklahoma.

Alfred's got the soft job

(HE NEEDED IT)

That old lift truck Alfred used to command finally broke down. The company junked it and Alfred didn't fret. Now he's got a new one equipped with MONARCH MONO-CUSHION TIRES—just like the rest of us. Alfred's happy, the company's happy—Alfred gets a soft ride, the company's saving money on floor and truck maintenance.

Your best source for replacement tires is the manufacturer of your vehicles, who can supply you, through his distributors, with Monarch Tires engineered for your application.

THE
MONARCH
RUBBER COMPANY
300 LINCOLN PARK • HARTVILLE, OHIO
DETROIT OFFICE, 7-255 GENERAL MOTORS BUILDING

SPECIALISTS IN INDUSTRIAL SOLID TIRES AND MOLDED MECHANICAL RUBBER GOODS

temperature to the tapping slag temperature is virtually the same with either calcite or dolomite stones, but the indicated concentration of heat in the lower bosh is more favorable with calcite stone. The difference is not great but it is definite and the indicated cause can be accepted with assurance inasmuch as the theortically indicated condition is sustained by actual operation. With operating conditions of East, the attempts in actual operation to substitute dolomite for calcite stone repeatedly gives the same effect—inability to carry as heavy a burden with dolomite as with calcite stone.

This comparison of South and East operations clearly indicates that the value of the two stones to furnace operating economy is determined entirely by the need for their respective chemical constituents in creating thermal conditions which are favorable to the economy. The fallacy of being governed alone by the ratio of silica to calcium (SiO_2/CaO) is emphasized by the comparison of South and East data in Table XV.

With dolomite, the ratio of silica to alumina in the slag is virtually the same for South and East, but the thermal conditions, indicated with theoretical calculation and observed in actual operation, are not. This again emphasizes the importance of McCaffery's teachings, namely, "there is not any broad generalization which is applicable to all blast furnace slags."

South and East slags both have a relatively high alumina content in the tapping slag, with the East composition approximating the theoretical ideal for the four principal constituents most favorable to the thermal effects in the bosh and hearth operation.

Ores Low in Alumina — Due to the depletion of the better grades of Lake ore many furnaces in the Middle West district now are operating with low alumina content tapping slag, caused by ore beneficiating methods which wash the alumina out of low-grade ore. Although the iron content can be raised in this manner the effect of the low alumina content is detrimental to the productive capacity and thermal economy in furnace operation.

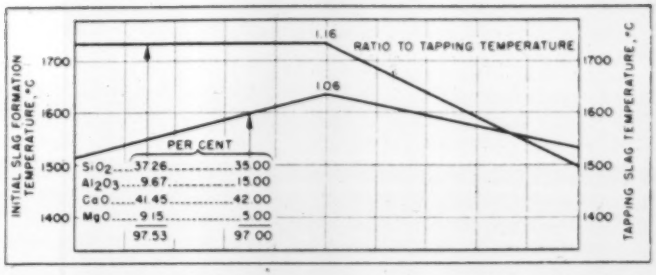


Fig. 14—Ill-effects of low aluminum content in ore mix on thermal conditions

Without an adequate alumina content in the ore mix the furnace operator is faced with meeting the condition with the best practical means available. Substitution of silica in the slag for depleted alumina produces a slag excessively acid, with which iron cannot be properly desulphurized. Substitution of calcium produces a slag both basic and excessively viscous, causing a difficult slag handling problem. Substitution of magnesia produces a slag which is basic but also fluid, thus taking care of both desulphurizing and handling problems. But the method of meeting the ill-effects of undesirable slag composition should be recognized as an expedient and not be

TABLE XIV

Thermal effects of South and East operations with two types of flux

	South — Dolomite		South — Calcite	
	Tetrahedron No.	Temperature, °C	Tetrahedron No.	Temperature, °C
Stage of slag formation:				
Initial	14	1506	7	1731
Maximum basicity	14	1698	....	....
Minimum basicity	14	1609	14	1801
Tapping slag	16	1402	8	1487
	East			
Stage of slag formation:				
Initial	5	1443	6	1468
Maximum basicity	7	1512	8	1611
Minimum basicity	5	1468	8	1495
Tapping slag	5	1482	6	1481

TABLE XV

Ratio of silica to calcium in South and East operations

	South		East	
	Dolomite	Calcite	Dolomite	Calcite
Ratio SiO_2/CaO	0.99/1.00	0.73/1.00	0.97/1.00	0.81/1.00
Slag analyses, %:				
SiO_2	32.15	32.15	35.03	35.03
Al_2O_3	16.23	16.23	14.51	14.51
CaO	32.29	44.21	36.08	42.99
MgO	15.88	3.96	11.43	4.52
S	1.41	....	....	1.78
Misc	2.04	....	....	1.17
	100.00	....	....	100.00

TABLE XVI

Effect of low aluminum in ore mix on thermal conditions

	Initial formation	Basicity — Maximum	Basicity — Minimum	Tapping stage
Chemical Composition, %:				
SiO_2	35.77	33.78	34.74	37.26
Al_2O_3	3.94	4.07	5.48	9.67
CaO	47.27	48.80	46.90	41.45
MgO	10.53	10.87	10.41	9.15
	97.51	97.52	97.53	97.53
Tetrahedron No.	7	14	7	8
Mineral Composition, %:				
Akermanite	24.24	....	17.40	63.42
Calcium bisilicate	....	....	....	2.86
Gehlenite	10.87	11.21	15.12	26.65
Tricalcium disilicate	....	....	....	7.03
Calcium orthosilicate	36.91	47.33	36.07	....
Monticellite	28.00	40.82	31.42	....
Magnesia	....	.63	....	....
	100.02	99.99	100.01	100.00
Calculated temperature:				
Centigrade	1732	1815	1733	1495
Fahrenheit	3150	3299	3151	2723

accepted as the ultimate solution.

Ill effects of a low-alumina content in the ore mix on the thermal conditions in the furnace bosh and hearth are shown by means of slag data from an actual furnace operation in Table XVI; they are also depicted graphically and compared with theoretical ideal conditions in Fig. 14.

Since the chemical composition of raw materials used, and the ratio to each other of the slag forming constituents are the cause of the undesirable thermal condition indicated, the furnace operator is helpless to correct the condition without a suitable change in the raw material chemical composition. In this phase of furnace operation the weight of the slag produced is not a factor because this weight does not create the undesirable thermal condition.

(To be continued)

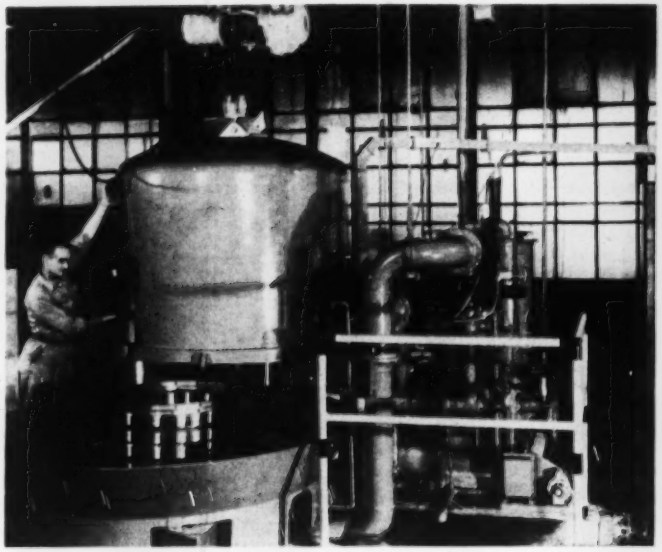
Furnace Design is Metal Miser

Savings in nickel and other critical alloy materials can be accomplished by proper design and construction of industrial furnaces, according to Kenneth W. Stookey, president of the Gas Machinery Co., Cleveland.

One method consists of heat treating specifications with furnace construction not requiring the critical alloy materials. An example is use of rotary furnaces for forging and heat treating. Rotary furnace construction needs only refractory and moderate quantities of carbon steel.

Other furnace applications do not lend themselves to complete redesign but are adaptable to substitution of materials. One instance is use of silicon carbide in roller hearth furnaces, replacing alloy steel.

Here again advantages are gained beyond just the saving in critical materials. Silicon carbide rolls will counteract the black spots, welding tendency, warping and other difficulties experienced with steel rollers. With silicon carbide it is possible to maintain full hearth loading at 2000° F while with alloy rollers loading must be reduced as high temperatures are approached and 2000° F is not a practical operation for alloy. They also cost less than alloy rollers.



BEARING CORROSION COMPLAINTS ELIMINATED

. . . thorough drying takes 45 minutes for large units

Dryer Handles Large Bearing Assemblies

HANDLING tapered roller bearing assemblies up to 54 inches in diameter and 40 inches in height at Timken Roller Bearing Co., Canton, O., this vacuum dryer is designed for an absolute pressure of 3.5 microns and can reach a pressure of only 5 microns in 20 minutes. A large steel mill roll neck bearing, weighing as much as 10,000 pounds, is dried thoroughly in about 45 minutes.

No external heat source is required since the bearings enter the bell jar chamber at a temperature of 130° F or higher. Since the vapor pressure of water at this temperature is 115.28 mm mercury, an operating pressure of 5 microns (0.005-mm mercury) produces a relatively high rate of evaporation. Smaller sizes of bearings can be handled of course, with the time required depending upon their geometry and size. Threaded fittings, or the centers of long pinned rollers are the last points to reach the operating pressure.

The bell jar fits onto a base plate and has pumping connections through its center. Feet on the base rim of the jar protect the sealing gasket when it is removed from the base. A 15-hp pump serves to bring the pressure to the desired level.

Previous method of washing and drying bearings often proved inadequate in meeting rust and corrosion complaints. With the vacuum equipment, corrosion can be eliminated and the bearings shipped clean and dry.

Machine Tests Belts

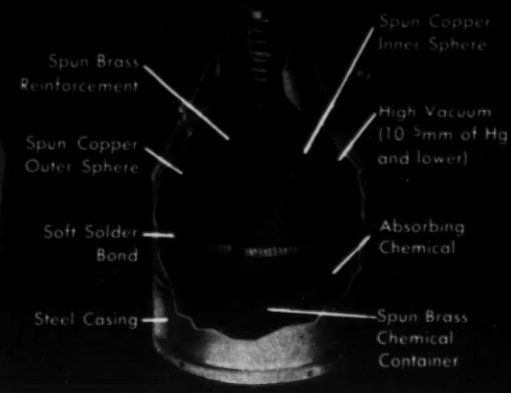
Conveyor belt testing machine operating at Raybestos-Manhattan's laboratory at Passaic, N. J., takes production scale belts up to 30 inches wide to include widths in general use. Data obtained will be applicable to wider and longer belts.

Machine tests any 30-inch wide 80-foot long conveyor belt up to 200,000 pounds total tension. Duplicating actual conveyor equipment arrangements, automatic recorders trace simultaneously power input, stretch, tension and speed at any speed up to 2000 fpm.

Recorded observations on this machine show the effect of pulley size, actual strength and factors of safety of a conveyor belt running over pulleys with any predetermined amount of tension load

It's COLD inside these liquid gas containers...

and polished copper helps keep 'em that way



Cutaway section of a Hofman "Standard" Liquefied Gas Container, made in a range of sizes from 5 to 2000-liter capacity.

This is Herb Basewit, design draftsman of Hofman Laboratories, Inc., holding an unretouched polished copper inner shell for a 25-liter container. A perforated spun-brass dish soldered on one end holds a chemical which absorbs any leakage of gas into the vacuum.

IN THE STORAGE and transportation of liquefied gases such as air, oxygen, nitrogen, hydrogen and helium, evaporation losses are the big problem (containers can't be sealed because of explosion risks). If insulation is not adequate for the *minus*-452 F temperatures encountered, losses are costly.

Hofman Laboratories, Inc., of Newark, N. J. took a big forward step and made some radical changes in container design. Resembling a giant picnic vacuum bottle, the "Standard" Hofman Container is constructed of an inner and outer copper sphere separated by an extremely high vacuum. Bulky insulation is eliminated and, through the use of polished copper, surface radiation losses are greatly reduced.

Here, as in many other industrial applications, copper does a multi-purpose job better than any other metal by providing: (1) the ductility and malleability necessary for deep-spinning the hemispheres, (2) an unequalled metal for soldering, and (3) a smooth-surface, fine-grain metal that will readily take a mirror-like finish.

Anaconda Metals are made by The American Brass Company, General Offices: Waterbury 20, Conn. 9205

Here Herb is seen pointing to the hole for exhausting air to obtain vacuum. A solder bond is used to join the copper hemispheres.

ANACONDA

COPPER and BRASS

Save Time—Prevent Waste—with FEDERAL Gaging Systems

DIAL INDICATORS AND GAGES

There's a Federal Dial Indicator for every gaging requirement — over 80 different models, ranges, sizes, graduations, styles. Also Dial Indicator Gages in regular and special designs — for all dimension-control jobs: snap, hole, thickness, caliper, comparator, etc. Gages for inspecting many dimensions simultaneously: Multi-Dimension Dial Gages . . . Federal Electricator Gages.

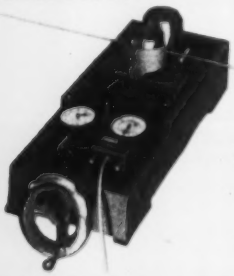
AIR GAGES

FEDERAL DIMENSIONAIR:

- Greatest measuring range of all — .003" with 2500 to 1 magnification.
- *Full* 7½" calibrated scale shows *how much* size is out *accurately*.
- Indicates earlier when approaching size.
- Shows inaccuracies positively.
- Use same gage on rough and finish work.
  - Gets into small or irregular holes.
  - Easy to set.

CONTINUOUS-MEASURING GAGES

Glass tubing, bare wire, insulated wire, steel rods, sheet, and similar continuous material is gaged and size-controlled or chart-recorded automatically. Gages for controlling grinders and other production machines.



AUTOMATIC SORTING GAGES

High speed, completely automatic from machine to package. Semi-automatic or hand fed. Inspect multiple dimensions. Anything from 1/64" diam. balls to — what's your sorting problem?

See them AT BOOTH 733
SOUTH HALL • A.S.T.E. SHOW

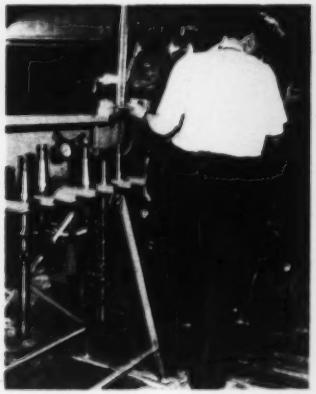
FEDERAL

FEDERAL PRODUCTS CORPORATION • 1213 EDDY STREET • PROVIDENCE 1, R. I.

and overload. Elastic and permanent stretch are measured through the cycle of minimum, average and maximum belt tension. Relation between troughability, load sag between idlers, thickness of belt and tension is shown.

Pneumatic Drawbar Speeds Setup

Pneumatically operated drawbar developed for a milling machine by shop personnel at Texas Engineering & Mfg. Co. Inc., Dallas, has reduced the time required to change arbors from an average of 3 minutes to an average of 10 seconds a change. The attachment uses a 6-inch pneumatic cylinder

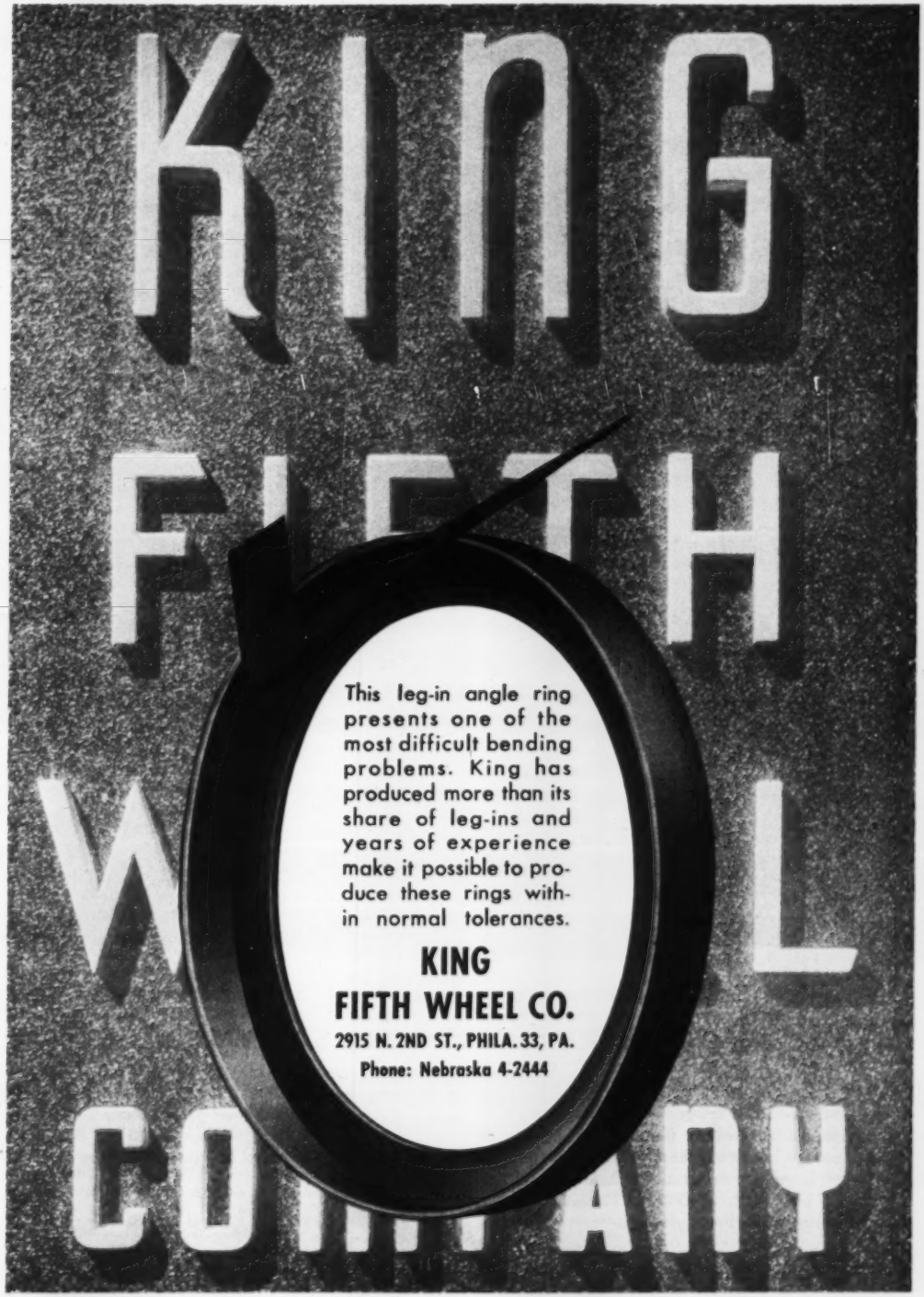


ARBORS SET FOR QUICK-CHANGE
. . . air cylinder does the work

operating at 40 pounds pressure and a quick change adaptor on the arbors. Pin on the draw bar is coordinated with the key on the spindle.

To change arbors the operator presses a button releasing pressure on the cylinder, turns arbor one-fourth turn disengaging key, removes the arbor and inserts a new one, turns it one-fourth turn and presses another button to restore pressure.

Job in question was a heavy welded assembly calling for a variety of milling, boring, center-boring and reaming operations at close tolerances. Altogether ten changes in arbors were required. Due to the weight of the assembly it was not considered practical to move the work to different machines for different operations. Tolerances required such a complicated fixture that use of duplicate fixtures was


KING
FIFTH
WHEEL
COMPANY
This leg-in angle ring presents one of the most difficult bending problems. King has produced more than its share of leg-ins and years of experience make it possible to produce these rings within normal tolerances.
KING
FIFTH WHEEL CO.
2915 N. 2ND ST., PHILA. 33, PA.
Phone: Nebraska 4-2444

For positive, vibration-resistant SELF-LOCKING UNBRAKO SOCKET SET SCREWS

UNBRAKO Self-Locking Socket Set Screws won't work loose. Non-slip internal wrenching provides positive drive. Self-locking feature prevents creep and subsequent loosening. Machinery stoppage and production losses are materially reduced. Write for descriptive literature. STANDARD PRESSED STEEL Co., Jenkintown 33, Pennsylvania.

Standard UNBRAKO *Self-Locking Set Screws, #4 to 1" inclusive, are available from your* UNBRAKO *distributor's stocks. Ask him for your supply of these and other* UNBRAKO *threaded industrial fasteners.*

SPS JENKINTOWN, PENNSYLVANIA

UNBRAKO® SOCKET SCREW DIVISION

CAP SCREWS • SET SCREWS • SHOULDER SCREWS • DOWEL PINS • PRESSURE PLUGS

likewise considered impractical.

According to TEMCO, the drawbar principle can be applied to any mill by changing the drawbar length. Actual installation time for the attachment should not exceed one hour.

Electronics Meet To Be in N. Y.

Several hundred of the nation's leading technical authorities in the electronics field will meet in Washington May 5 through May 7 for a symposium on progress in quality electronic components. Three-day conference to be held in the Interior Department auditorium will cover a wide range of technical subjects in both production and developmental fields.

Papers stressing new electronic components, materials and fabrication techniques are to be presented by recognized authorities in industry and government. The program is designed to present a review of available electronic components, particularly in the light of reliability consistent with the needs of both the military and commercial industry.

The meeting is sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers and the Radio-Television Manufacturers Association. J. G. Reid Jr. of the National Bureau of Standards is chairman of the symposium committee.

Fire Snuffed with Dry Chemical

Fire that raged unchecked for five days in a Venezuela oil well was extinguished recently by dry chemical fire extinguishers in 50 seconds. The fire occurred when an electric spark ignited some surface gas. The resulting blowout around the outside of the well casing tossed mud, rocks, water and gas 30 feet into the air. After attempts at extinguishment by foam, water and carbon dioxide failed, six 150-pound dry chemical units were used. The units are made by the Ansul Chemical Co., Marinette, Wis.

Dry chemical is specially treated sodium bicarbonate. It differs from ordinary baking soda in that it is free-flowing and moisture-repellent so that it can be expelled through an extinguisher without clogging up the outlets.

Knot It! Kink It! ...IT WON'T HURT A Tuffy® SLING!

Patent No. 2,454,417

Get your FREE Tuffy 3-ft. sample sling and see for yourself how Tuffy's patented braided wire fabric makes an extra flexible sling. Tie it in knots, kink it, then see how easily it is straightened without damaging it in any way.

The reason is Tuffy's unique construction. (See enlarged photograph). Scores of wires are stranded into 9 parts, then machine woven into a wire fabric that has unusual flexibility and strength. Even cutting one of the 9 parts will not cause stranding.

11 Types of Tuffy Slings Available

There's a Tuffy Sling for *your* needs. If not, Union Wire Rope engineers will help work out special slings. Each one is proof-tested to twice its safe working load and the safe working load is stamped on metal tag attached to each sling. If you have your own rigging loft, Tuffy fabric is available by the reel.

MAIL COUPON FOR YOUR FREE SLING

See for yourself that all the things we claim for Tuffy Slings are true. A free 3-foot sample is yours for the asking. Just mail the coupon and your Union fieldman will deliver yours to you.

UNION WIRE ROPE CORPORATION
Specialists in Wire Rope, Braided Wire Fabric and High Carbon Wire
2160 Manchester Ave. Kansas City, Mo.

Gentlemen: Please have my Union Wire Rope Fieldman deliver my free Tuffy sling sample.

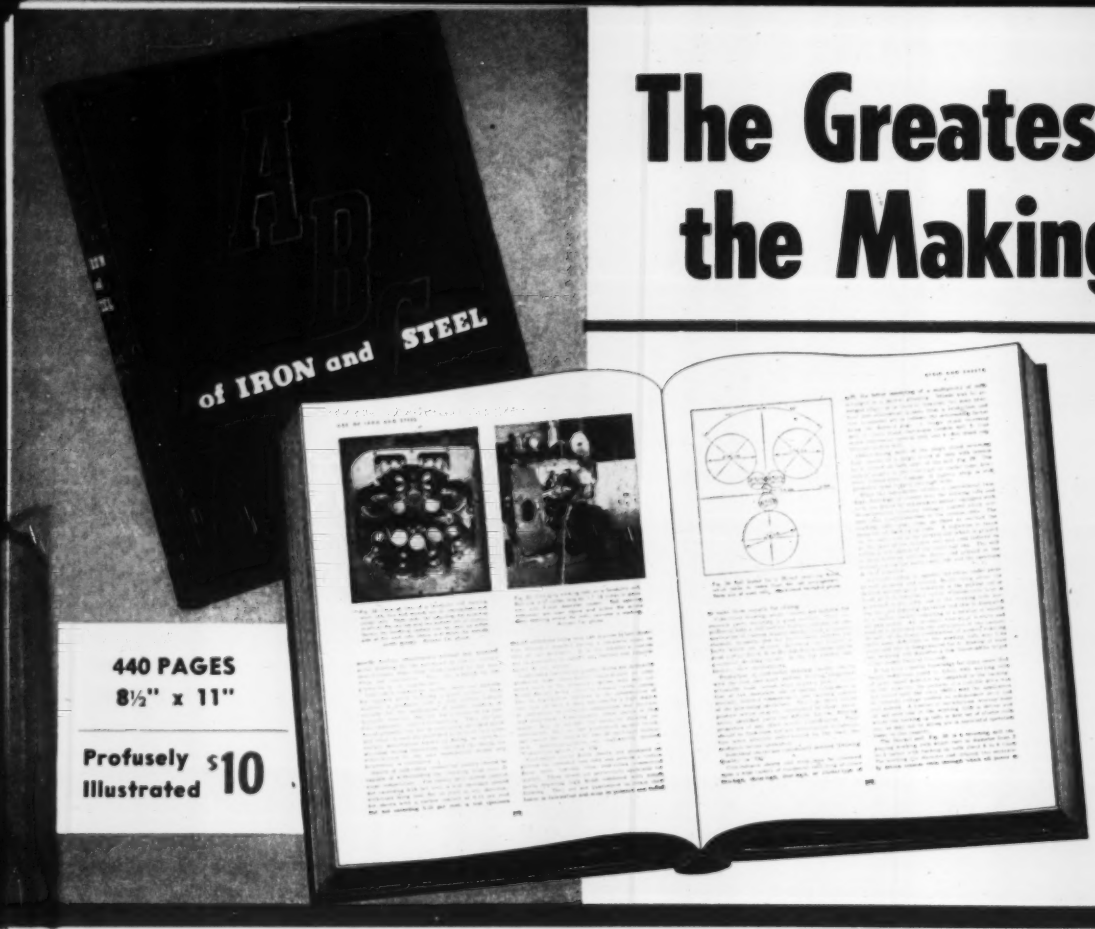
NAME_____

FIRM NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

The Greatest the Making



Step by Step through Steelmaking with

- **MINING IRON ORE**—Beneficiation and Reserves. By E. W. Davis.
- **IRON ORE**—Transportation and Handling. By P. L. Tietjen.
- **METALLURGICAL COKE**—Coal preparation, Bedding, Coking Mixture, Handling, Ovens, Equipment, Recovery Plant. By Philip S. Savage.
- **SCRAP IRON AND STEEL** — Origin, Grades, Preparation, Handling, Transportation, Specification, Consumption, Dealers. By Edwin C. Barringer.
- **PIG IRON**—Impurities, Fuel, Temperatures, Flux. By B. M. Stubblefield.
- **OPEN-HEARTH STEEL** — Charging, Refining, Rebuilding, Chemical Reactions, Teeming. By L. F. Reinartz.
- **BESSEMER STEEL** — Design, Mixers, Charge, Blowing Procedure, Scientific Control. By H. W. Graham.
- **ELECTRIC ARC FURNACE STEEL** — Power, Controls, Electrodes, Lining, Melting Procedure, Grades. By Walter M. Farnsworth.
- **WROUGHT IRON**—Early and Modern Processes of Balling and Rolling. By Charles R. FonDersmith and Edward B. Story.
- **ART OF ROLL PASS DESIGN**—Mills, Layout, Guides, Profile Development. By Ross E. Beynon.
- **SEMIFINISHED STEEL**—Soaking Pits, Blooming and Billet Mills, Heating and Rolling Practice. By Karl L. Fetters and H. H. Hottel.
- **STRUCTURAL SHAPES AND RAILS** Mill Layout, Pass Design, Rerolling, Finishing, Testing. By Frederick M. Gillies and Wilbur E. Dittrich.
- **MERCHANT SHAPES**—Heating, Type Mills, Rolls, Guides, Cold Drawing. By Fred S. High.
- **BARS**—Furnaces, Mills, Sections, Tolerances, Pitch and Templates. By C. W. Barrett.
- **PLATES** — Heating Facilities, Mills, Scheduling, Descaling, Shears, Quality, Cladding. By W. Louis Bunting.
- **PIPE AND TUBING** — Butt and Lap Welded Pipe, Galvanizing, Conduit and Electric Metallic Tubing. By H. E. Engelbaugh.
- **SEAMLESS STEEL PIPE AND TUBES** Heating, Piercing, Expanding, Stretch Reduction, Continuous Rolling, Rockrite Process. By Bryant Bannister.
- **WIRE AND WIRE RODS**—Rod Rolling, Cleaning, Machines, Dies, Compounds, Annealing, Patenting, Galvanizing. By Kenneth B. Lewis.
- **STRIP AND SHEETS** — Heating and Mill Speeds, Shears, Handling, Processing, Classification, Pickling, Annealing, Galvanizing, Cold Reducing, Quality Control. By Charles L. McGranahan.
- **TIN PLATE**—Hot Dip, Electrotinning, Cleaning and Annealing, Tin House, Pots, Assorting, Handling. By Alfred E. Kadell.
- **STAINLESS STEEL** — Melting, Hot Rolling, Surface Treatment, Sizes, Wire Cold Rolling, Corrosion, Types. By B. H. DeLong.

Published by The Penton Publishing Co., Penton Building, Cleveland 13, Ohio

Book Ever Written About of Iron and Steel

By 31 Experts

The ABC brings you the combined knowledge and experience of 31 outstanding authorities on steelmaking! It's the only book of its kind available today.

THAT BOOK YOU SEE PICTURED at the left, "The ABC of Iron and Steel," represents years and years of constant work and study in every branch of iron and steel practice—every statement in it is the result of actual, first-hand experience. The ABC was conceived and published in answer to the demand for a book that should cover the entire iron and steel industry.

It was obvious from the start that no *one* man *could* write such a book. The thorough and comprehensive knowledge necessary for such an undertaking could be acquired only by long and careful study, and years of practical experience in each one of the branches of iron and steelmaking. A lifetime would be too short.

But the problem was solved. For each chapter we searched the iron and steel industry to recruit some of the authorities best qualified to tell you about modern iron and steel practice. The chapter on Hot and Cold-Rolled Strip and Sheets was written by Charles L. McGranahan; the production of Forgings by Waldemar Naujoks; the making of Tin Plate by Alfred E. Kadell—and so on right down the list. The ABC has *thirty-one* different authors, each a recognized authority on some one branch of the iron and steel industry, and each writing about just his own particular specialty.

The result is that every statement in "The ABC of Iron and Steel" bears the stamp of authority. It is the last word on every question of iron and steel practice.

Although this book is the work of skilful, highly trained specialists, every bit of it is written in simple, non-technical language, and to make things doubly clear, hundreds of photographs of the various operations and equipment are included in the book.

Reading "The ABC of Iron and Steel" is just like watching a ton of iron ore in its progress down from the mines, through the blast furnace, steel works, and rolling mills with an expert always at your elbow to explain every process and answer all your questions.

the Experts

- **TOOL STEEL** — Furnaces, Melting, Teeming, Analysis, Molds, Hot Working, Annealing, Cold Drawn. By George A. Roberts and Charles F. Sawyer.
- **FORGINGS**—Hammers, Presses, Types, Dies, Trimming, Heating and Finishing. By Waldemar Naujoks.
- **GRAY IRON CASTINGS**—Melting, Patterns, Molds, Machines, Cores, Pouring, Cleaning, Properties. By R. L. Collier.
- **MALLEABLE IRON CASTINGS**—Melting, Sprues, Composition, Molds, Flasks, Annealing, Testing, Application. James H. Lansing.
- **STEEL CASTINGS**—Composition, Melting, Patterns, Sands, Molds, Cores, Finishing, Testing. By Charles W. Briggs.
- **HIGH-ALLOY STEEL CASTINGS** — Furnace, Molding Operations, Sand, Heat Treatment, Surface Cleaning, Inspection. By W. H. Worrilow.

It's the story of the nation's greatest industry written clearly and simply in nontechnical terms by 31 outstanding authorities on steelmaking.

SEND NO MONEY—Just fill in and mail the coupon below. It will bring you a copy of "The ABC of Iron and Steel" by return mail. Everyone in your shop from top executive to apprentice will benefit from its use. Don't delay. Order your copy now while you have it in mind.

SEND FOR YOUR COPY TODAY

THE PENTON PUBLISHING COMPANY, Book Department CG
1213 West Third Street, Cleveland 13, Ohio

Send me a copy of "The ABC of Iron and Steel."

☐ On ten days trial for free examination, following which I will pay for the book at $10, plus postage, or return it in good condition.

☐ Remittance enclosed* in which case the book will be sent postpaid.

☐ C.O.D.

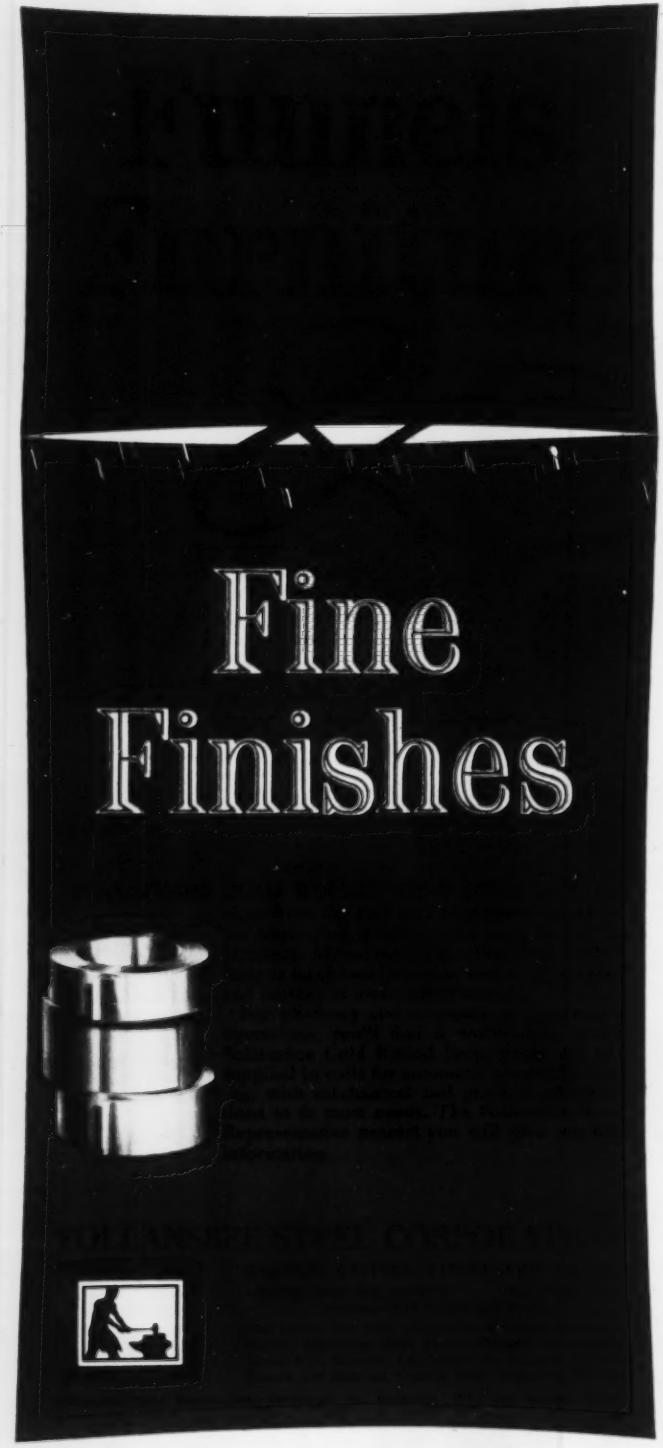
SIGNED _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

*Please add 30c to cover state sales tax on orders for delivery in Ohio.



CALENDAR
OF MEETINGS

March 30-31, Packaging Machinery Manufacturers Institute: Semi-annual spring meeting, Hotel Dennis, Atlantic City, N. J. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

March 31-April 2, International Acetylene Association: Annual spring meeting, Hotel Claypool, Indianapolis. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

March 31-April 2, American Institute of Mining & Metallurgical Engineers: National open hearth conference, William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Ernest Kirkendall.

April 1-3, Steel Shipping Container Institute: Annual meeting, Hotel Biltmore, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 1-4, American Management Association: National packaging exposition and conference, Atlantic City Auditorium, Atlantic City, N. J. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

April 3-4, Instrument Society of America: Annual steel instrumentation symposium, Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

April 4-5, National Association of Cost Accountants: Regional cost conference, Indianapolis. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 7-8, American Management Association: Production conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

April 7-9, American Society of Lubrication Engineers: Annual meeting, Hotel Statler, Cleveland. Society address: 343 S. Dearborn St., Chicago 4. Secretary: W. F. Leonard.

April 9, Cutting Tool Manufacturers Association: Spring meeting, Hotel Cleveland, Cleveland. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

April 9-11, Society of the Plastics Industry Inc.: Annual technical session, Reinforced Plastics Division, Edgewater Beach Hotel, Chicago. Society address: 67 W. 44th St., New York 18. Secretary: William T. Cruse.

April 16-18, American Institute of Electrical Engineers & American Welding Society, Detroit Section: Annual welding conference, Rackham Memorial Bldg., Detroit. Conference publicity: J. S. Francis, Consumers Power Co., Jackson, Mich.

April 17-18, Caster & Floor Truck Manufacturers Association: Spring meeting, Hotel Hollenden, Cleveland. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

April 17-18, American Machine Tool Distributors Association: Annual spring meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

April 18-19, Lead Industries Association: Annual meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 18-19, National Association of Cost Accountants: Regional cost conference, Atlanta. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 18-21, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Secretary: Frank G. Gustafson.

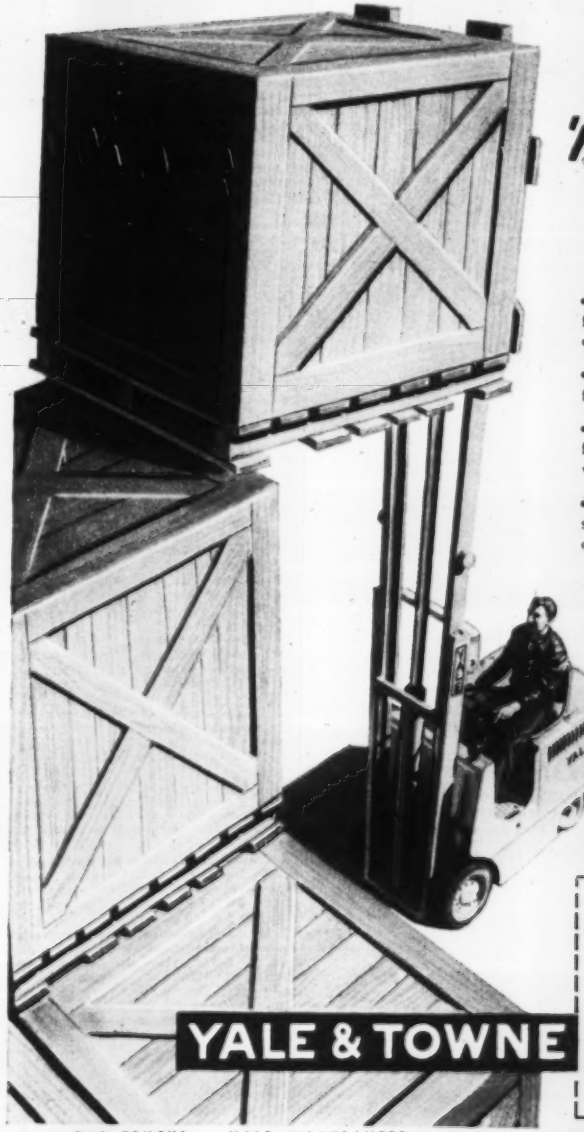
April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 815 Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-23, American Coke & Coal Chemicals Institute: Eastern regional meeting, West-

(Continued on p. 104)

More of industry's tough jobs go to YALE because...

EXCLUSIVE FEATURES EQUIP YALE ELECTRIC TRUCKS FOR



'round-the-clock service

- **EXCLUSIVE YALE** Hypoid Gears have more tooth surface for longer wear, greater shock resistance. They're completely enclosed in one oil-sealed unit.
- **EXCLUSIVE YALE** Involute Spline Drive Shaft resists fracture from wear fatigue—outlasts all others.
- **EXCLUSIVE YALE** Lift Channels are specially rolled for extra strength. Ball bearing rollers reduce channel wear, cut battery drain due to friction.
- **EXCLUSIVE YALE** Inclined King Pins absorb road shock on steering shaft, make driving easier. Reduce operator fatigue.

BECAUSE YALE Electric Trucks pay their way *better* by working longer—they're the first choice of users who want the *most* for their truck dollars. To discover how a YALE Electric Truck investment can accumulate *extra* handling savings for you—fill out and mail this coupon today.

YALE & TOWNE

YALE is a registered trade mark of the Yale & Towne Mfg. Co.

The Yale & Towne Manufacturing Co., Philadelphia 15, Pa.

MAIL THIS COUPON TODAY

The Yale & Towne Manufacturing Co., Dept. 83
Roosevelt Boulevard & Haldeman Ave., Philadelphia 15, Pa.

Please send me your free new detailed bulletin, THE YALE ELECTRIC TRUCK

Company_____

Name_____ Title_____

Street_____

City_____ State_____

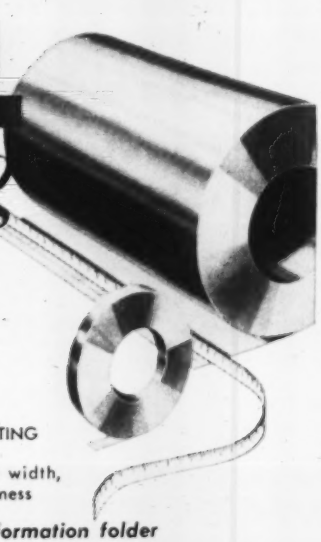
In Canada write: The Yale & Towne Mfg. Co., St. Catharines, Ont.

YALE GAS TRUCKS • YALE WORKSAVERS • YALE HAND TRUCKS • YALE HAND AND ELECTRIC HOISTS

The only plant in the Eastern U.S. equipped for

COIL pickling

From 48" down to 1"



- ROLLER LEVELLING
- EDGE ROLLING • SLITTING
- COIL SHEARING
- SHEET PICKLING—any width, any length, any thickness

Write for Detailed information folder

MARSAM CORPORATION

Subsidiary: **AMERICAN TOOL & SUPPLY CO.**

OFFICE: FRICK BUILDING, PITTSBURGH 22, PA. **PLANT:** McKEES ROCKS, PA.

ATLAS FOR SMALL ORDERS
FOR LARGE ORDERS
FOR HARD-TO-DO-JOBS

OPERATIONS: Thread cutting and machining on automatics and hand-operated screw machines. Thread rolling, metal stampings, bending and spot welding. Facilities for secondary operations.

SPECIFICATIONS: For prompt quotations, submit your requirements giving details, specifications and delivery dates.

METALS: Steel, stainless steel, brass and alloy steels.

WRITE TO DEPT. S FOR

FREE CATALOG

OF STANDARD PRODUCTS

AT-104A

ATLAS SCREW & SPECIALTY CORP.

450 BROOME STREET, NEW YORK 13, N. Y.

(Concluded from p. 102)

chester Country Club, Rye, N. Y. Institute address: 711 14th St. NW, Washington. Executive secretary: Samual Weiss.

April 21-22, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 23-25, American Institute of Steel Construction Inc.: Spring engineering conference, Hotel Commodore, New York. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 28-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Secretary: H. C. Delzell.

April 29-30, Metal Powder Association: Annual spring meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

May 1-7, American Foundrymen's Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society address: 616 S. Michigan Ave., Chicago. Secretary: W. W. Maloney.

May 1-7, Annual International Foundry Congress & Exposition: Convention Hall, Atlantic City, N. J. Host: American Foundrymen's Society.

May 2-3, Industrial Fasteners Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 4-8, Electrochemical Society Inc.: Semi-annual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

May 5-7, Automotive Engine-Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis, Ind. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

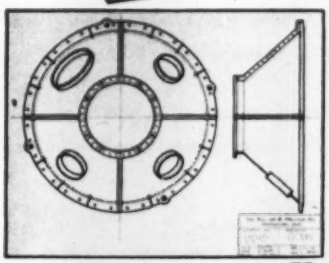
May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Werntz.

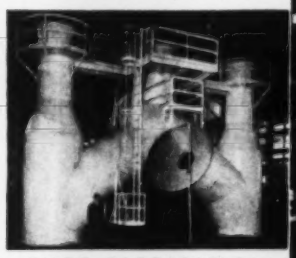
May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8-9, National Association of Sheet Metal Distributors: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

POLLOCK

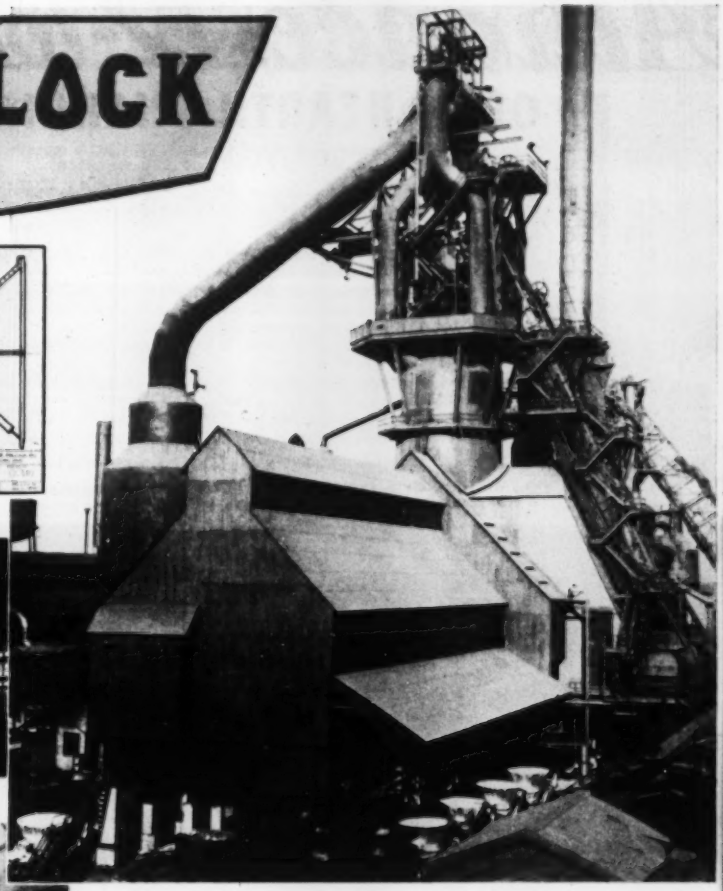


ENGINEERING



SHOP FABRICATION

FIELD ERECTION



Correlating the skills of Pollock engineering, fabrication and field erection to specific operational requirements of The Youngstown Sheet & Tube Company are evidenced in this blast furnace. In addition to furnishing the steel work for this blast furnace, Pollock designed and built auxiliary equipment, including the hot metal ladle cars and cinder cars shown in the above picture. The experience which the Pollock Company has gathered in over eighty-five years is available to you in planning your new projects.

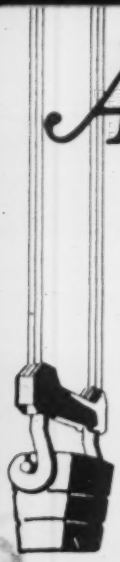
Blast furnace STEEL WORK

POLLOCK

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

Alliance 12-ton

OPEN HEARTH CHARGING MACHINE



● This photograph shows a new low-type 12-ton Alliance Charging Machine recently installed in one of the world's largest and most efficient steel producing plants.

This machine, designed and built by Alliance, world's largest builder of big cranes, has an unusually large number of exclusive new features that make charging operations easier and less costly.

For instance there's a —

Spring-loaded pitman that always keeps the trolley on the rails, providing ample traction for pushing scrap into the furnace and for the retraction of peel and box.

Box section bridge girder made of welded I-beams reinforced by diaphragms spaced at 3-ft. intervals.

Full length machinery deck plate located between the main and outrigger girders provides lateral stiffness and a safety platform for maintenance.

Stabilized, shock-absorbing wheels are held in contact with both upper and lower rails by means of springs, which reduces shock to the operator.

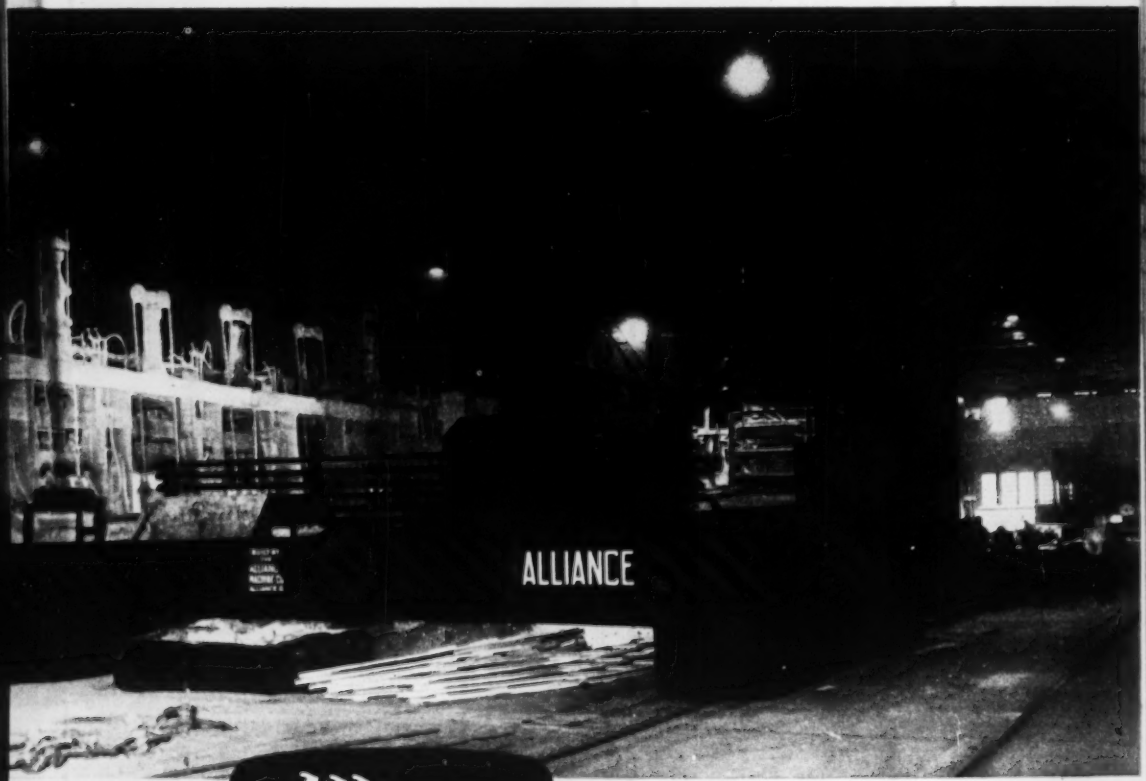
Four track-equalizer trucks, located at the corners on eight-wheel bridges, compensate for any irregularities in the track.

Finger-tip control provided by new type hydraulic lock rod.

All gears (including track wheel gears) are fully enclosed and run in oil.

These and many other Alliance features result in smoother overall plant operation.

Whenever it's a problem of handling heavy materials of any kind at your plant, contact Alliance . . . the world's most respected builder of big cranes.



THE Alliance MACHINE COMPANY

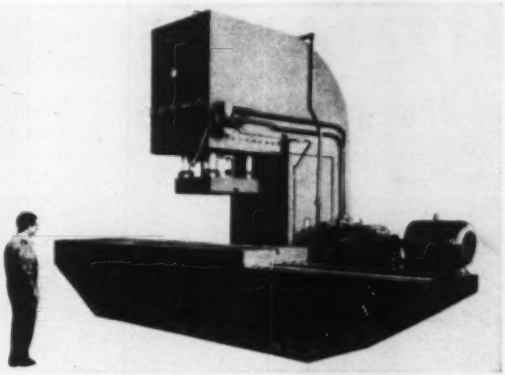
World's largest builders of world's largest cranes

MAIN OFFICE
ALLIANCE, OHIO • PITTSBURGH OFFICE **1622 OLIVER BUILDING, PITTSBURGH, PA.**

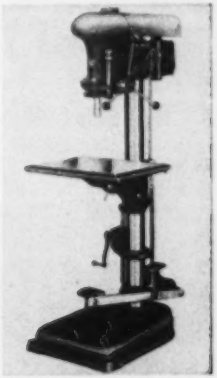
LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

New Products and Equipment

PRESS DRIVE TENSIONER
. . . makes belt alignment constant



RAPID HYDRAULIC TWO-DIMENSION POSITIONING
. . . allows several blows at varied placed without set changes



ALLOY STEEL DRILL SPINDLE
. . . assures greater accuracy

Drill Press Series Introduced

USE REPLY CARD—CIRCLE No. 1

Two-way drive aligner-belt tensioner is a feature of the 1650 series drill press line produced by Boice-Crane Co., 1018 Central Ave., Toledo 6, O. Device is designed to assure belt alignment at all times. Belt tension is released instantly for quick speed changing without wrenches or tools. Presses have involute design six-tooth splined drive.

All splined drive parts, including pulley drive sleeve, are made of steel to effect quiet running and longer life. Four heavy grease-sealed ball bearings help assure an accurate, true running pulley spindle. Spindle is covered completely by a redesigned guard.

Other features include positive, quick-acting, nonmarring quill and column locks. Speed selection is available in high and low ranges: 500, 925, 1750, 3250 and 5500 in the former; 425, 775, 1330, 2200 and 3340 in the latter.

REPLY CARDS

on page 121 will bring you more information on any new products and equipment in this section.

Hydraulic Straightening Press

USE REPLY CARD—CIRCLE No. 2

Versatile hydraulic straightening press featuring fast two-dimension positioning of work is announced by E. W. Bliss Co., Canton, O. Quick positioning results from hydraulic systems that move the press bed from side to side and plunger assembly from front to back under lever control. Through this system, several blows can be struck at different places on a single piece without changing press table setting. Operating speed is further increased by rapid advance and return feature that allows slide to move rapidly to the work then slow up and do its actual straightening at slow speed, returning to "up" position rapidly.

In operation, levers on the front of the bed control front to back motion of the ram, side to side motion of the bed and conventional up and down motion of the slide. When the work is positioned under the ram, a fourth lever on the front of the crown locks it in position and transfers pump output to the system controlling plunger.

Company's Hydro-Dynamic circuit, as applied to this 100-ton straightener, consists of a high speed variable delivery rotary pump. This controls pressing speed and reversal without numerous controlling valves. Action is said to be quicker and subject to less friction.

Press Capacity Increased

USE REPLY CARD—CIRCLE No. 3

Redesigned 18-inch drill press, made by Duro Metal Products Co., 2681 N. Kildare Ave., Chicago 39, Ill., offers increased capacity on a wider variety of jobs. Among major improvements, alloy steel spindle with No. 2 Morse taper, is made larger in diameter and precision ground to assure greater accuracy. Permanently lubricated precision ball bearings are sealed to safeguard against grit and dust. Precision bored bearing seats provide perfect alignment. Close-grained head casting eliminates vibration. Machine is rated ¾-inch capacity in cast iron; speed range is 450 to 1965 rpm.

Meter Monitors Radiation

USE REPLY CARD—CIRCLE No. 4

Radiation survey meter for monitoring foundry areas for industrial radiography is offered by Tracerlab Inc., 130 High St. Boston 10, Mass. The instrument has scale ranges of 5, 50 and 500 milliroentgens per hour and 5 and 50 roentgens per hour. These scales are arranged in order of increasing sensitivity, have different colors and are changed automatically when scale is switched.

Submersion and shockproof, meter operates under severe temperature and humidity conditions. Other features attributed include

PREVENTIVE MAINTENANCE

eliminates truck downtime

READY-POWER IS *BEST* FOR PREVENTIVE MAINTENANCE

Tie up a truck because of power failure? Never! Equip your fleet with *interchangeable* Ready-Power gas-electric units and, then, have one extra for the shop. Thus, power units can be rotated for preventive maintenance . . . and your trucks stay *on the job* . . . where they belong.

Remember...Your Truck Is No Better Than Its Power!

CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan

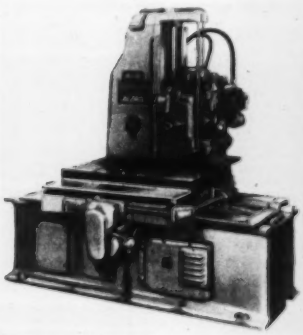
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units, Gas and Diesel-Electric Power Units for Industrial Trucks

a 4-inch rectangular meter; built-in checking source for determining proper instrument functioning; and pushbutton illumination of the meter dial. Its accuracy is maintained at plus or minus 15 per cent indicated dosage reading anywhere on its scale.

Boring, Milling Line Expanded

USE REPLY CARD—CIRCLE No. 5

Line of Spiramatic Jigmil precision boring and milling machines made by DeVlieg Machine Co., 450 Fair Ave., Detroit 20, Mich., is enlarged by addition of series B and C machines. Improved machine line incorporates two developments in precision boring: Spindle head with automatic transmission; automatic trip mechanism for spindle bar feed. Spindle head has single



. . . incorporates automatic transmision

helical gears operating in constant mesh. Speeds are preselected by rotating a dial to desired speed. Actual speed change is made automatically by depressing a single pushbutton with spindle running forward or reverse.

Spindle head incorporates bar feed unit with automatic trip mechanism that stops bar feed at any predetermined point. This feature provides a means for controlling accurately the depth of bar feed when dealing with counterboring, facing and back-facing operations. Combination of graduated dials and vernier scales provide depth of feed.

Precision Milling Machine

USE REPLY CARD—CIRCLE No. 6

Rigidity, precision and capacity of larger machines are attributed to the model 22M miller made by Diamond Machine Tool Co., 3429

In just about an hour, this midget furnace can make a 22-pound heat of steel to any desired analysis—then pour a test ingot which J&L metallurgists, in their unending search for better quality steel, put through rugged chemical and physical experiments.

Behind The **J&L STEEL** Trade Mark

A Research Program with a Single Objective . . . Better Steel

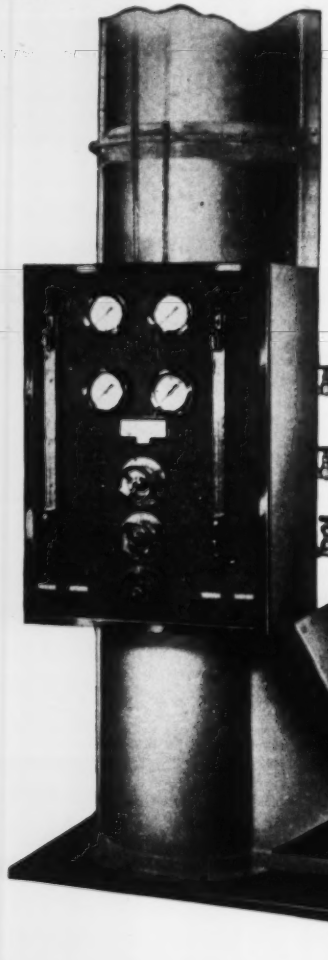
Many new developments in the art of steelmaking at J&L originate in the research laboratories. Here scientists study every phase of operation—from raw materials to finished steel products.

Before good steel can be made it is necessary to have good raw materials. In the mining of iron ore in Minnesota, Michigan and northern New York, J&L research has pointed the way to an increased supply and to a consistent improvement in quality. In the preparation and utilization of coal, J&L research has led to significant improvements in the quality of metallurgical coke, which favorably affects iron and steel quality. Thus, from the ground up—research is charting the course of progress at J&L, pointing out new and better ways to make steel, and to make it more useful to industry.

Behind the J&L trade mark, and behind every J&L steel product is research—creative, imaginative and continuous research—research with the single objective of making better steel.

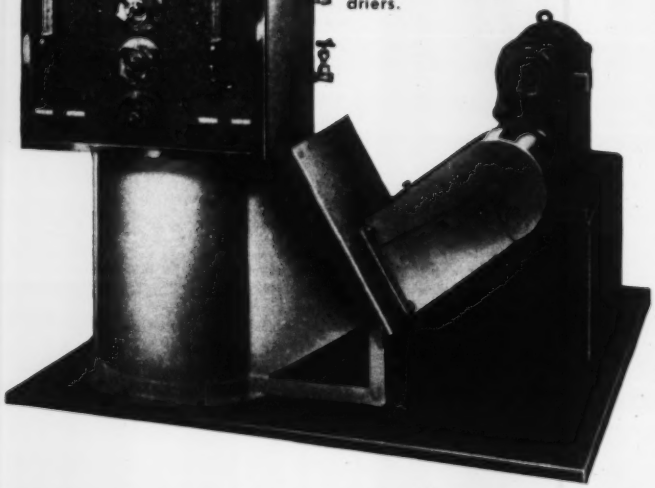
JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

SUPAIRCO
Oxygen
FROM AIR
at Lowest Costs to You



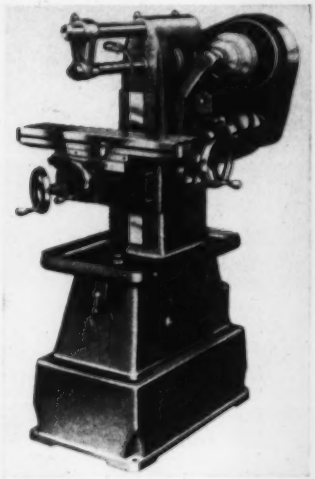
20 years of experience and the latest technological developments, have enabled us to produce a new type SUPAIRCO OXYGEN PLANT that is marked by its endurance, simplicity of operation and low maintenance. We offer a size to meet every requirement, and if you are a user of large quantities of OXYGEN or NITROGEN GASES OR LIQUIDS, we can assure you that a SUPAIRCO OXYGEN PLANT will cut your oxygen bills practically in half.

SUPAIRCO DOUBLE RECTIFICATION COLUMN WITH LIQUID OXYGEN PUMP constitutes the main apparatus of the oxygen plant. Only additional equipment is the air compressors, air washers and driers.



SUPERIOR AIR PRODUCTS CO.
128 MALVERN STREET • NEWARK 5, N. J., U. S. A.
Also Manufacturers of Plants and Apparatus for Liquid Air, Liquid Oxygen, Liquid Nitrogen and Containers and Flasks for Liquefied Gases.

E. Olympic Blvd., Los Angeles 23, Calif. In working size, machine offers longitudinal travel of 14 inches; maximum vertical travel from center of spindle to table top, 15 inches; and 13½-inch cross traverse. Full table working surface is 5¾ x 24 inches. Spring loaded



. . . has 14-inch longitudinal travel

dials help in quick setting. For standard nematype motors, machine has an automatic kickoff on the power feed and a motor drive design arrangement. The company offers a full line of accessories and attachments made for the model.

Copier Prints 46-Inch Width

USE REPLY CARD—CIRCLE No. 7

Medium volume copying machine, the Copyflex model 20, made by Charles Bruning Co. Inc., 125 North St., Teterboro, N. J., is capable of a full 46-inch printing width. This provides ample space for a customary 42-inch roll stock or multiple cut sheet inserted side-by-side. The model requires no installation work, but connects readily to a 115-v, 60-cycle ac power line. It weighs 900 pounds, is 56 inches high, 70 inches wide and 56 inches deep.

Using translucent originals—drawings, business forms or communications—the machine speeds production of low-cost, odorless, errorproof and ready-to-use copies. When the original is drawn, typed or written on both sides or is on opaque material, reflex film copy

Making Steeltex Lath — *Scratchboard Drawing for Pittsburgh Steel Company by T. W. Hunter*

Progress in Steel . . . *Serves The Construction Industry*

The vast construction projects you see today on every hand depend upon steel in many forms. This is one of several reasons why Pittsburgh Steel's Program of Progress was conceived—to supply more Pittsburgh Steeltex reinforcing lath to the construction industry.

Steeltex is a special mesh, welded from Pittsburgh wire and stitched by the ingenious machines shown above to heavy, waterproof, fibrous backing. It is used extensively to reinforce concrete floors, interior plaster, masonry veneer and stucco walls in all types of structures from airport buildings to housing developments—from warehouses to office buildings—in fact, wherever you find good construction.

The Program of Progress at Pittsburgh Steel is designed to increase ingot capacity by fifty percent and to diversify the Company's line of products better to serve its customers. Some of the objectives of this expansion program have been accomplished—others are rapidly nearing completion as outlined below. This Program of Progress is an important part of the steel industry's answer to the universal demand for more steel in order that military and civilian requirements for this vital metal be supplied in full.

PROGRAM OF PROGRESS

Acquisition of Thomas Strip Division	100% complete
Installation of new High Lift Blooming-Slabbing Mill	100% complete
Increase Blast Furnace Capacity by 12%	50% complete
Increase Open Hearth Capacity by 50%	60% complete
Installation of new 66-inch Hot Sheet-Strip Mill	60% complete
Installation of new 66-inch Cold-Rolled Sheet-Strip Mill	40% complete

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

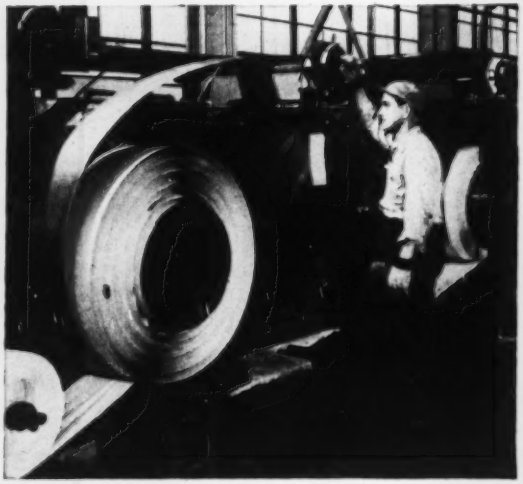
G-E ADJUSTABLE-SPEED DRIVE "SPOOLS" STRIP STEEL FASTER!

"Packaged" Speed Variators boost winder output by eliminating time-consuming tension adjustments

Without the proper drive on the winders, "spooling" chrome strip steel as it comes off an annealing line can be a difficult time-consuming operation. "Spool" build-up will vary with the gage of the steel being processed. This affects tension on the strip as it is being wound, making it necessary to make many time-wasting manual adjustments.

The Wallingford Steel Company overcame these difficulties recently when it installed seven G-E Speed Variators on its annealing line. Today, the winders operate automatically after an initial setting. The speed variators handle all operating speeds from 5 to 80 feet per minute. And because each drive is "packaged", it is simple to operate one, two, three or all of the winders in the line simultaneously.

The speed variator, one of G-E's adjustable-speed family, is helping manufacturers in every field to increase production with improved quality control, saving scarce materials, cutting rejects, and increasing versatility of existing machinery. There's a good chance that one or more of this versatile adjustable-speed drive family can do the same for you. Send the coupon below for complete details. *General Electric Company, Schenectady 5, N. Y.*



Once the operator makes a speed setting, the winder, equipped with a G-E Speed Variator Drive, maintains that speed automatically and holds tension constant during roll build-up.

WHICH DRIVES ARE BEST FOR YOU?

This 26-page manual will help you decide. It shows you how to go about selecting the *right* drive. The handy drive chart included is worth your detailed study. Bulletin GEA-5334. Check here ☐

General Electric Company, Section Q 646-15
Schenectady 5, N. Y.

Please send me the bulletins checked:

☐ for reference only

☐ for planning an immediate project

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

THE ACA MOTOR—*Speed ranges to 20:1*—An adjustable-speed a-c motor. Speed range 3:1 or 4:1 continuous; for intermittent operation from 6:1 to 20:1. Bulletin GEA-4883. Check here ☐

THE SPEED VARIATOR—*Speed ranges to 40:1*—An adjustable-voltage d-c drive that uses a-c power. Speed ranges 8:1 to 40:1 and beyond. Bulletin GEA-5335. Check here. ☐

THY-MO-TROL*—*Speed ranges to 100:1*—The most accurate, most versatile, and fastest acting of all G-E adjustable-speed drives. Speed ranges of 100:1 or better. Bulletin GEA-5337. Check here. ☐

ELECTRONIC SPEED VARIATOR—An electronically controlled version of the Speed Variator that offers most of the features of Thy-mo-trol for applications in the 15 to 60-hp range at moderate cost. Bulletin GEA-5336. Check here ☐

** Thy-mo-trol is the General Electric Company's registered trademark for its electronic motor control system.*

Headquarters for ELECTRICAL ADJUSTABLE-SPEED DRIVES

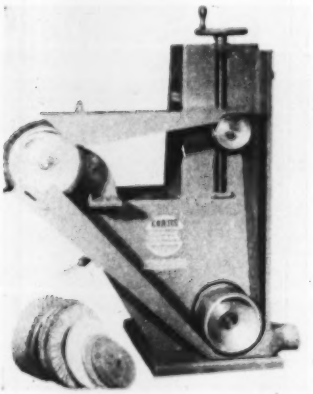
GENERAL ELECTRIC

is made in the machine. This requires no dark room or tray development. Copies can be made in colored lines as well as black and on white or colored paper.

Abrasive Grinder and Polisher

USE REPLY CARD—CIRCLE No. 8

Wide range of general grinding and snagging, plus flat and contour grinding and polishing can be done on the model 500 made by Curtis Machine Division, Lincoln Park Industries Inc., 1300 E. Second St., Jamestown, N. Y. Compact machine has heavy welded steel construction, takes 27 x 50 inches of floor space. Shield bearing spindle design permits quick interchange among all types of contact wheels in various widths, contours or special shapes.



. . . for flat or contour work or polishing

Hand screw adjustment of aluminum idler pulley permits use of contact wheels to maintain belt length and speed for maximum efficiency and cutting. Positive belt tracking mechanism is convenient to the operator. Abrasive belt is pulled through the grinder instead of being pushed, eliminating puckering and achieving increased belt life.

Test Stand Has Dual Head

USE REPLY CARD—CIRCLE No. 9

Operating characteristics of component parts such as generators, pumps and compressors are determined by a test stand with dual head developed by U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif. Use of dual head permits wider variation than a single head in take-off speeds and tests two components at one time. Variable speed motor can be changed instantly by turning control dial.

Brackets are mounted on the motor to accommodate the several components to be tested. For continuous duty, rating is 7½ to 50-hp; for intermittent duty, 10 to 75-hp. Ratio between the two take-off shafts is usually 2:1, but speeds and ratios can be changed to meet user's specific requirements. Use of a tachometer with test stand to give direct revolutions per minute readings for both take-off shafts is optional.

Compact Heat-Treating Furnace

USE REPLY CARD—CIRCLE No. 10

Heat-treating furnace, model CH, offered by Waltz Furnace Co., Dept. S, 1901 Symmes St., Cincinnati, O., is equipped for heat-treating all types of water or oil-hardened steel. It can be used for an-

Good for many years at hard labor

YORK·GILLESPIE

CUSTOM-BUILT MACHINERY

for

Steel Mills • Steel Fabricators
Industrial Manufacturers

Now is the time to modernize your industrial machinery. For never before has American industry encountered such a challenge! Its double job of producing for defense and civilian needs demands plant machinery built stronger, to last longer.

York-Gillespie Manufacturing Company — designers and custom-builders of special machinery — and York Engineering and Construction Company form an unbeatable team working to develop and build machinery to fit your production requirements.

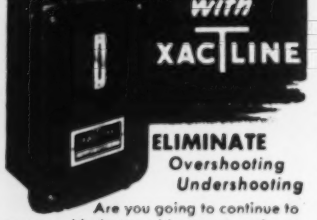
From Your Own Blueprint or Our Design

Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.

Send York-Gillespie your machinery specifications. Your inquiries will receive prompt attention.

YORK-GILLESPIE MANUFACTURING CO.
and
YORK ENGINEERING & CONSTRUCTION CO.
991 Penn Avenue, Pittsburgh 22, Pa.

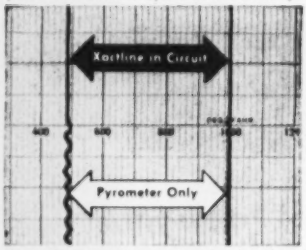
Automatic
"STRAIGHT-LINE"
TEMPERATURE CONTROL
with
XACTLINE



ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw-tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on-off cycle resulting in "Straight-Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight-Line" temperature control produced by XACTLINE and the saw tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel-fired furnaces equipped with motor-operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

PRICE $89.50 F.O.B. CHICAGO
Nothing else to Buy

GORDON SERVICE

CLAUD S. GORDON CO.
Manufacturers & Distributors
Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines
Dept. 14 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 14 • 2035 Hamilton Ave., Cleveland 14, Ohio

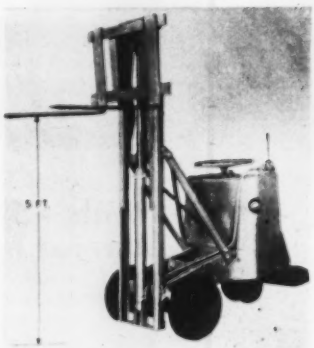
nealing, normalizing, pack hardening or stress relieving. Compact design is calculated to use a minimum of floor space: Housing covers 38 x 116-inch area.

High-temperature furnace is full muffle underfired type with separate hardened floor inside muffle. Its range of 1000 to 2400° F is controlled automatically. Furnace door is counterbalanced for operating ease. Recirculating oven for tempering or drawing bathes work with high velocity air held to constant temperature by automatic control. Oven is lined by alloy steel and equipped with perforated shelf. Its range is 250° to 1100° F.

Power Driven Lift Attachment

USE REPLY CARD—CIRCLE No. 11

A 5-foot power driven lift attachment for its Moto-Bug tractor is announced by Kwik-Mix Co., Port Washington, Wis. Handler's device has a capacity rating of 1000-pounds at a 15-inch load center. Under this load, the machine can climb a 12 per cent grade with full load and has 61-inch turning radius. Made for special handling in shipping and industrial work, lift unit operates from a power driven hydraulic pump. For easy maneuvering, the operator rides on rear step, controlling a large steering wheel connected directly to the dual rear wheels through a 3.6 to 1 gear reduction.



. . . handles 1000 pounds at 15-inch center

Standard forks are 20 inches long and adjustable to any required width to a maximum 33 inches. Its 33-inch width clears aisles and doorways easily. Power is transmitted by V-belt and roller chain

LEBANON CIRCLE L Castings
in Stainless and Special Alloys...
require Control in Core-setting

There is just no "good enough" way to set cores, for close tolerances must be held if costly, time-consuming, corrective work is to be eliminated—and time is vital today. Core-setting and its companion step, core-making, call for precise skill and infinite care, yet these are but two of many production procedures followed with such care by all Lebanon craftsmen to produce CIRCLE (L) castings of *controlled* high quality.

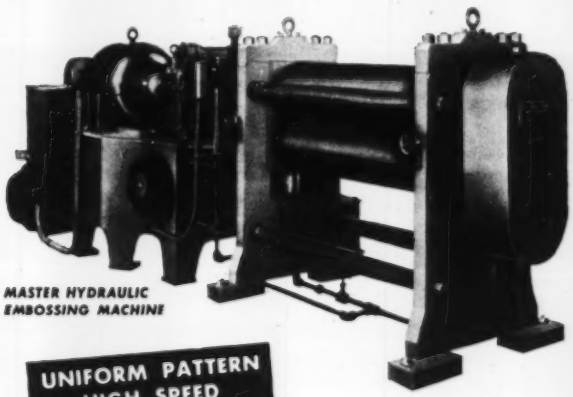
LEBANON STEEL FOUNDRY
Lebanon, Pennsylvania
"In the Lebanon Valley"

CIRCLE L LEBANON
Steel and Alloy Steel
Castings

MEET THE METAL WORLD OF TOMORROW

Ahead of Competition

With the GREATEST Development in History for Embossing and Finishing Sheet and Coiled Strip



MASTER HYDRAULIC EMBOSSING MACHINE

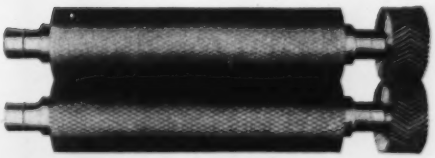
UNIFORM PATTERN
HIGH SPEED
LOW COST

U. S. Patent Pending

MASTER *Hydraulic* EMBOSSING MACHINE

with

ENGRAVED MATCHED HARDENED FORGED STEEL ROLLS



ENGRAVED MATCHED HARDENED FORGED STEEL ROLLS

U. S. Patent Pending

- *Produces a wide variety of prefabricated finishes*
- *Makes light gauge metals rigid and stronger*
- *Localized embossing and cold rolling in one operation*
- *Many installations now in operation*

Be Ready to Serve Your Customers Ahead of Competition

Write TODAY for Details!

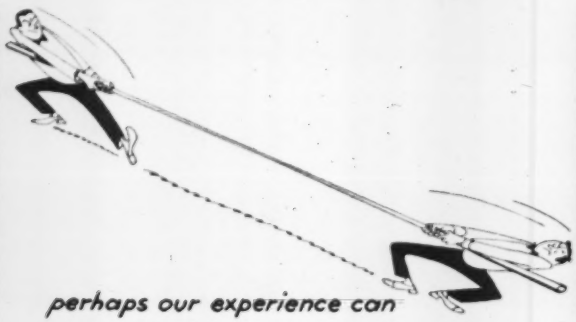
MODERN ENGRAVING & MACHINE CO.

1413 CHESTNUT AVE., HILLSIDE 5, NEW JERSEY

COPYRIGHT 1952 MODERN ENGRAVING & MACHINE CO.

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS.

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.



perhaps our experience can

STRETCH

your alloy steel supplies!

You have doubtless heard about "bar-stretchers." Have you ever seen one? Wheelock, Lovejoy has several – any one of which can help you stretch your alloy steel supply so that you can keep up your production schedules during this period of unavoidable shortages. Having been in the steel business for over 100 years, our staff of metallurgists is in a unique position to help solve your difficulties. Our "bar-stretchers" include suggestions for substitute grades – alternate methods of manufacture – varying your present methods of treatment – and many more!

A letter or phone call to your nearest Wheelock, Lovejoy warehouse will bring an experienced man to help you stretch your alloy steel supply.

And he will be delighted to be of service! *SCRAP is worth money, and every pound turned in means more steel for you – so get in the SCRAP!*

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK, LOVEJOY & CO., INC.

Warehouse Service

CAMBRIDGE • CLEVELAND
CHICAGO • HILLSIDE, N. J.
DETROIT • BUFFALO
CINCINNATI

In Canada
SANDERSON-NEWBOULD, LTD., MONTREAL

HY-TEN and AISI

131 Sidney St., Cambridge 39, Mass. and Cleveland • Chicago • Detroit Hillside, N. J. • Buffalo • Cincinnati

through automotive differential from a standard 6-hp gasoline engine.

Power Line Duct Booster Fan

USE REPLY CARD—CIRCLE No. 12

Paint spray booths, large range hood exhausters, heating or ventilating systems are applications suited for a heavy duty belt-driven fan introduced by Chelsea Fan & Blower Co. Inc., Plainfield, N. J. Made with motor mounted outside of the air stream, the unit is recommended for air movement up to 350° F. It operates at moderate static pressure up to 2 inches.

Nonoverloading cast aluminum airfoil-type propellers are completely ball bearing and semi-enclosed or explosion proof, as required. Hoods can be supplied for outside mounting. Sizes are available from 16 to 36 inches; air delivery ranges from 2700 to 23,000 cfm.

Low Temperature Brazing Flux

USE REPLY CARD—CIRCLE No. 13

Handy & Harman, New York 38, N. Y., announces a brazing flux for use in joining of titanium and zirconium and their alloys. The low temperature minimizes oxygen and nitrogen contamination of the titanium. Tensile strengths of 45,000 to 50,000 psi are obtained with butt joints in commercially pure titanium. Heating may be done with either oxyacetylene torch or furnace and ordinary brazing technique is used.

Filter for Uniform Suction

USE REPLY CARD—CIRCLE No. 14

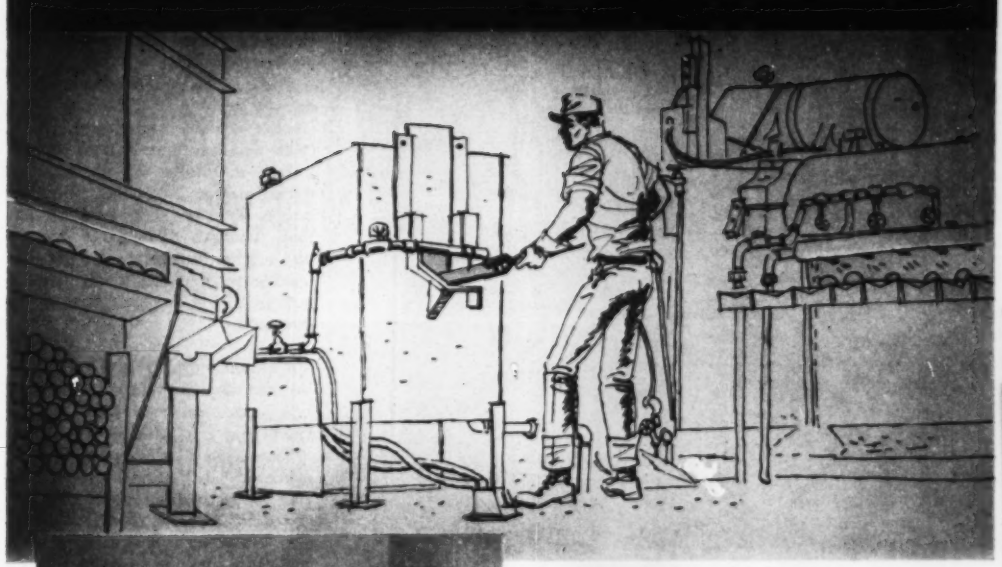
Dynaclone, a cloth type filter for collecting industrial dusts from various operations, is available from W. W. Sly Mfg. Co., Cleveland 2, O. It features uniformly maintained suction and removal of dust from filter bags by reversing air flow.

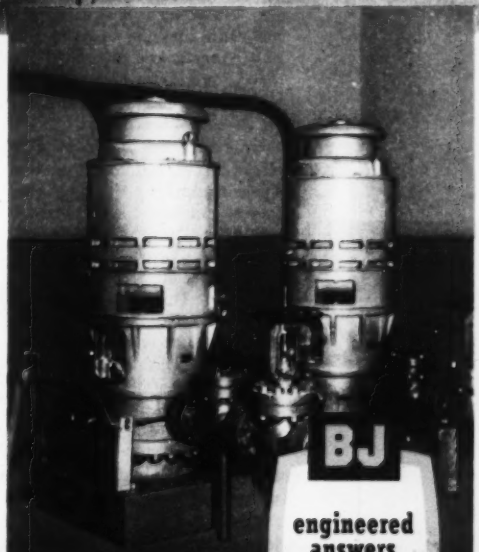
Collets and Feed Fingers

USE REPLY CARD—CIRCLE No. 15

Hardinge Brothers Inc., Elmira, N. Y., offer style S Sure-Grip Master collets and feed fingers, both with removable pads. Pads can be rapidly changed to handle different sizes of bar stock. Col-

KNOCKS OFF SCALE IN 1½ SECONDS!





This automobile plant uses two BJ Hydropress Pumps for descaling. One pump services as many as 10 cabinets (with 5 operating at once).

Auto industry uses BJ Hydropress Pumps to descale forged parts hydraulically!

Manual or mechanical descaling operations are time-taking and profit-robbing. Especially when a product requires several descalings during production. You'll save time, money and rejects by descaling hydraulically with BJ Hydropress pumps.

Here's one of the many examples of modern hydraulic descaling as used by the automotive industry. During the heating of axle bars prior to forming, scale is created and must be removed. This is done in a hydraulic descaling cabinet. As the bar is inserted, a lever is tripped and high velocity water at 1500 to 2000 psi hits the bar from 3 to 5 nozzles. Scale is removed in 1½ seconds! Afterwards the hot bar is placed on a forming roll.

The BJ Hydropress pump is ideal for this type of work because of its unique construction features. It does not require relief valves, accumulators or extra heavy fittings and piping. Its double volute design creates inherent balance at all heads and capacities. Its vertical construction allows the use of a simple foundation and a minimum of floor space.

For more information call your local BJ sales engineering office or write:

Byron Jackson Co.

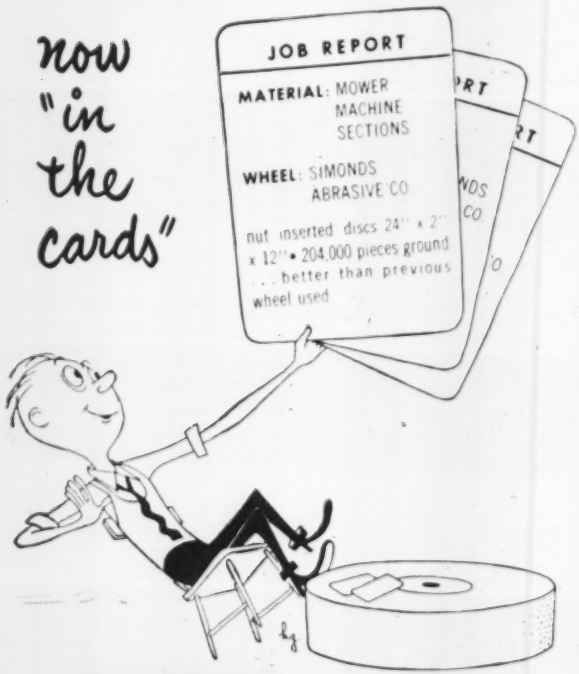
Since 1872

P. O. Box 2017, Terminal Annex, Los Angeles 54, California

Sales Offices in Principal Cities

Better disc grinding

now "in the cards"


JOB REPORT
MATERIAL: MOWER MACHINE SECTIONS
WHEEL: SIMONDS ABRASIVE CO
nut inserted discs 24" x 2" x 12" • 204,000 pieces ground . . . better than previous wheel used

SIMONDS ABRASIVE CO.

Grinding Wheels

Take the gamble out of grinding wheel selection. Deal yourself in on top grinding performance with Simonds Abrasive Company Grinding Wheels. Complete line includes wheels of every combination of grain, grade and structure . . . wheels of all shapes and sizes . . . mounted wheels and points, segments and abrasive grains . . . industrially proved production tools backed by Simonds Abrasive Company complete quality control, expert engineering service, and 60 years experience as one of the nation's leading manufacturers of grinding wheels. Send now for free data book. Also the name of your Simonds Abrasive Company distributor.

SIMONDS ABRASIVE CO. PHILADELPHIA 37, PA. BRANCH WAREHOUSES CHICAGO DETROIT BOSTON DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

let features independent dovetail lock clamp that anchors pads in place. Right and left hand threads, with dovetail action, lock pad in place so screw cannot loosen in operation.

Grinding Wheel Dresser

USE REPLY CARD—CIRCLE No. 16

Fluidmotion wheel dresser, developed by J & S Tool Co., East Orange, N. J., dresses any wheel from smallest diameter up to 36-inches, maintains an accuracy of 0.0001-inch up to 14-inch diameter wheels and to 0.0005-inch on 36-inch diameter wheels. It dresses two angles tangent to a radius in one continuous motion with 0.0001-inch accuracy, without the use of dovetails.

Air Flow Control Valve

USE REPLY CARD—CIRCLE No. 17

A continuous air flow control valve that regulates air flow from a compressed air source to an operator using respiratory protective air line equipment is introduced by Mine Safety Appliances Co., Pittsburgh 8, Pa. It is for use with air line respirators, abrasive masks and abrasive helmets.

Improved Temperature Control

USE REPLY CARD—CIRCLE No. 18

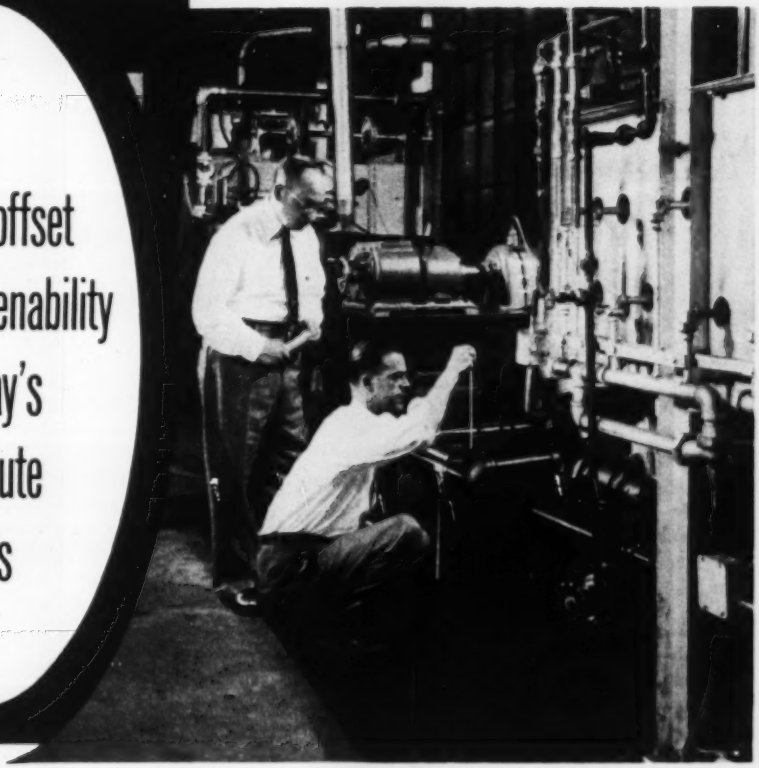
Improvements in design and the electrical circuit of the line of Temcometer temperature controllers is announced by Thermo Electric Mfg. Co., Dubuque, Iowa. Instruments provide stepless and wasteless control of power supply to electric furnaces, ovens, melting pots and other heating devices. It automatically compensates for changes in line voltage and will maintain constant watt-hour input and even temperature regardless of wide variations in line voltage.

Chuck Jaw Adjuster

USE REPLY CARD—CIRCLE No. 19

Precision adjustment of American Standard chuck having serrated type jaws is possible with the use of Micro Jaw-Set, available from Whiton Machine Co., New London, Conn. It features a single adjusting screw that controls radial movement of the top jaw so as to give full tooth adjustment in either direction. This also eliminates blind spots within the en-

How to offset lower hardenability in today's substitute steels



Switch to GULF SUPER-QUENCH, *the oil with greater quenching power*

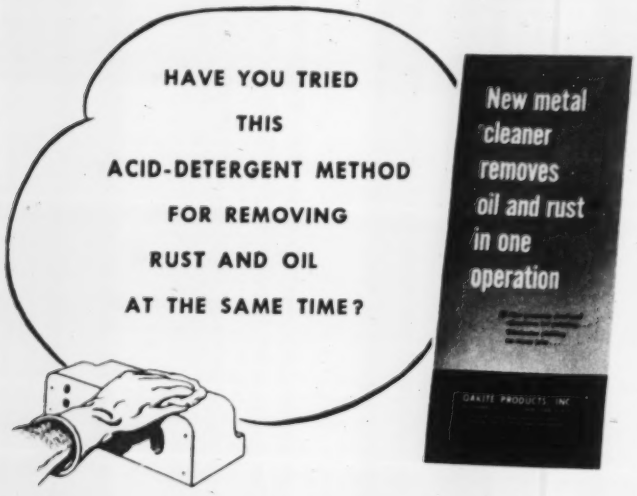
Is the current alloy shortage creating a heat-treating problem for you? Must you accept alloy steels with less nickel, molybdenum, and chromium than you originally specified? Then you'll be interested in the performance of Gulf Super-Quench. Because of its greater quenching power, this outstanding quenching oil helps offset the lower hardenability of today's substitute steels.

Gulf Super-Quench passes through the vapor stage far more quickly than conventional quenching oils. This means that the cooling rate is extremely fast at the outset, an important factor in the depth and uniformity of hardening. In the succeeding stages Gulf Super-Quench has a slow cooling rate, like that of conventional quenching oils, and therefore has the same minimum tendency toward distortion and cracking.

Greater quenching power of Gulf Super-Quench adds up to greater depth of hardening and more uniform hardness! One of the most practical advantages of Gulf Super-Quench is greater uniformity of results on steels of variable hardenability.

For further information on Gulf Super-Quench, call in a Gulf Sales Engineer today. Write, wire, or phone your nearest Gulf office.

GULF SERVES INDUSTRY



Metal craftsmen using Oakite Compound No. 33 say it is just what they've been looking for: a metal-cleaner that combines three important operations into one:

1. **It removes rust** *at the same time that*
2. **It removes oil** *at the same time that*
3. **It prepares the metal for painting**

Oakite Compound No. 33 removes rust, heat scale, tarnish, other oxides, stamping and forming oils, rust preventives, carbon smuts, soldering and welding fluxes, identification inks and similar soils. It develops excellent paint adhesion on steel, cast iron, aluminum sheet and castings.

For Use in Tanks or by Hand—Oakite Compound No. 33 is great for soak-cleaning metal parts of moderate size; and great for hand-swabbing on large metal surfaces.

Often Avoids Pickling—Oakite Compound No. 33 removes rust and oil so successfully that it frequently eliminates the need for a cycle of separate cleaning, pickling, neutralizing and paint-conditioning operations. It saves money in many ways.

FREE For a copy of "*New metal cleaner removes oil and rust in one operation*", write to Oakite Products, Inc., 34E Thames St., New York 6, N. Y.

Users Are Saying Good Things About Oakite Compound No. 33

PENNSYLVANIA: "Well pleased with removal of drawing compound, heat scale, rust and oil. Parts coming through good and clean."

CALIFORNIA: "This material is a beauty . . . one we've been waiting for on this jeep overhaul job."

MICHIGAN: "Removes oil, rust and scale faster . . . Increases adherence of rubber to steel for motor mounts and bumpers."

MICHIGAN: "Removing rust for less than 9 cents per wheel; sand blasting cost 25 cents."

TEXAS: "Eliminates practically all rejects and also handwiping of booster caps."

NEW YORK: "Have never seen such clean parts with such perfect paint adhesion . . . Putting Oakite Compound No. 33 in specification sheets for sub-contractors on these registers."

ILLINOIS: "Works a miracle taking heavy rust off steel cabinets."

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of U. S. & Canada

tire radial adjustment provided by the step-along feature of the serrated type chuck jaw.

Hot Materials Conveyor Belt

USE REPLY CARD—CIRCLE No. 20

Untreated ABC Hotstuff conveyor belt, introduced by Main Belting Co., Philadelphia 47, Pa., is recommended for industries using infra-red and radiant heat ovens for rapid drying. Constant temperatures upwards of 600° F are within the range of this belt. It features insulation between plies of asbestos cloth and between asbestos and the duck.

Portable Fire Extinguisher

USE REPLY CARD—CIRCLE No. 21

Walter Kidde & Co. Inc., New York, N. Y., announces a 5-pound dry chemical portable fire extinguisher. Nozzle discharges a cloud-like pattern that is effective for extinguishing flammable liquid and electrical fires. With a range of 5 to 7 feet, pattern also eliminates possibility of splashing burning substances.

Pneumatic Impact Wrench

USE REPLY CARD—CIRCLE No. 22

A ¾-inch Thor portable pneumatic reversible impact wrench is offered by Independent Pneumatic Tool Co., Aurora, Ill. It is available with two types of spindles: Size 24 with ½-inch square drive and size 24S with a 7/16-inch hexagon quick change chuck integral with spindle.

Streamlined Luminaire

USE REPLY CARD—CIRCLE No. 23

An industrial luminaire, 2FPR-90, is available from Westinghouse Electric Corp., Pittsburgh 30, Pa. It is suitable for operation of two T-17 mogul fluorescent lamps rated at 85, 90 or 100 w. Unit features a rigid lampholder support, a heavily gusseted section that cov-

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

72. Convector Furnaces

Lee Wilson Engineering Co.—56-page illustrated brochure "Portable Base, Single Stack Radiant Convector Furnaces" covers design, operation and procedures to be followed in using these furnaces for annealing of sheet, strip and tin plate coils. Chart gives average monthly production per stack per hour for single and multiple stack coil annealing furnaces.

73. Bandsaw Machine

DoALL Co.—The Contour-matic hydraulically operated bandsaw machine is described in this illustrated 16-page brochure "Presenting a New Manufacturing Machine Tool." Bandmachining is explained in detail, and machine features are covered. Also included are data on conventional and high speed sawing, friction cutting, handling and polishing and other operations performed by the machine.

74. Precision Die Sets

Danly Machine Specialties, Inc.—Tooling advantages, in both time and cost reductions, offered by Danly precision die sets are presented in 12-page illustrated booklet "Save Tooling Time." Four major factors involved in die set convenience and efficiency are discussed in detail.

75. Presses

Cleveland Crane & Engineering Co.—Here is an 8-page illustrated catalog (No. 2010-B) which presents outstanding features of Steelweld line of bending, braking, punching, blanking, drawing and corrugating presses. Clearances, dimensions and specifications are given, along with data required for quotation.

76. Tracer Control Systems

General Electric Co.—Here's some information on electronic contour follower systems for machining irregularly shaped parts. 4-page folder GEA-5980 covers one, two and three dimension tracer control systems for use on lathes, boring mills, milling machines and drilling machines. Each system's components, features and operation is described along with photos and diagrams.

77. Stainless Steel Slide Chart

Carpenter Steel Co.—4 x 9¼-in. slide chart presents much valuable information on Carpenter stainless steels, including relative workability, standard analyses, suitability for various operations, welding data, general corrosion resistance and characteristics of 21 types.

78. Drilling & Tapping Tools

Commander Mfg. Co.—12-page illustrated catalog No. 601 contains descriptive material, specifications and application data on line of production tools, including adjustable Multi-Drill multiple drill head, tapper, Multi-Angle drill unit, drill chip breaker and drilling coolant tube.

79. Protective Plastic Paint

Corrosite Corp. — Characteristics, applications and methods of use of tough, corrosion resistant, protective plastic paint are described in 8-page bulletin. Finish offers protection against marine atmospheres, tropical climates, chemical attack, abrasive action and other conditions.

80. Controlled Lubrication

Farval Corp.—"Studies in Controlled Lubrication" is 8-page brochure which shows six representative applications of controlled lubrication systems suitable for lubricating industrial machines ranging from the largest heavy-duty steel, brass and rubber mill equipment to small machine tools, textile and printing machinery.

STEEL
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on numbers circled at left in—

NAME
COMPANY
PRODUCTS MANUFACTURED
ADDRESS
CITY AND STATE

Fill out, detach at corners and mail. Please TYPE or PRINT.

| | | |

81. It's A Hold-Up

Ballenger Mfg. Co.—The Kenco stock support guide described in 4-page illustrated bulletin "Here's Your Guide" is applicable for supporting materials being processed on blanking, forming, pipe cut-off and bending, and other dies. Guide can be used to support bars, strips, sheets and pipes on presses, shears, benders and other machines. How to use these devices to advantage is explained.

82. Work Gloves

Richmond Glove Corp.—There's a work glove for every conceivable use in 8-page illustrated booklet No. 52. All leather, leather palm, canton flannel and Jersey gloves are described in gauntlet and wristlet styles. Handy selector facilitates selection of type of service for the glove, desired features and proper glove needed under type of cuff desired.

83. Electric Motors

Allis-Chalmers Mfg. Co.—Construction details of explosionproof fan-cooled and nonventilated motors are given in illustrated bulletin 51B7388A. These fan-cooled motors are available in ratings of 2 to 100 hp, and the nonventilated motors range from ½ to 2 hp. They meet all requirements and are approved by Underwriters' Laboratories for use in Class I, Group D and Class II, Groups F and G atmospheres.

84. Battery Chargers

Electric Products Co.—In 4-page bulletin 10-210 you'll find descriptive and illustrative information on full line of type S single-circuit motor generator battery chargers for industrial batteries. These self-contained chargers require no manual attention during the charge. Simplified listing aids selection of the right charger for any popular size truck battery.

85. Protective Packaging

Hinde & Dauch Paper Co.—24-page pocket-size booklet No. 14 of the Little Packaging Library tells "How to Pack War Materials in Corrugated Shipping Boxes." Materials of all types—from frozen eggs to ammunition—are considered.

86. Gas Cutting Machine

Air Reduction Co.—Portable, versatile and accurate are descriptive terms that can be applied to the No. 20 Radiagraph portable gas cutting machine described in 8-page illustrated bulletin ADC 672. This unit is motor driven and guided by a straight track, template or other means. Speed of cutting ranges up to 40 in. per minute. Machine also cuts arcs with radii from 1 to 32 in. and can guide up to three torches simultaneously.

87. Electric Air Valve

Bellows Co.—Wherever air must be controlled in hazardous locations, the Electrair explosionproof valve is usable. This control is a four-way directional air valve which meets Group D, Class I standard for wiring in hazardous locations. Device is electrically controlled, but powered by pressure of air it controls. Solenoids that operate on 8 v trigger the valve, and speeds to 2200 cycles per minute are possible. If you're interested, get bulletin AVX-310.

EDITORIAL REPRINTS:

88. Machine Tooling

"Tooling: Versatility Harnessed to a Machine" is title of informative reprint taken from Mar. 10, 1952 issue of STEEL, which tells how to get more production per man-hour per machine through imaginative tooling. Suggestions offered may help you overcome problems resulting from obsolete machinery, tough materials and shortage of skilled help.

89. Palletized Machining

In reprint of article entitled "Palletized Machining Speeds Flow of Tank Transmissions" STEEL associate editor Ed Karpick reports how GMC's Chevrolet-Cleveland Div. nearly doubled production of tank transmissions by eliminating lost motion in machining operations. Armor steel cases and carriers ride through processing line on pallets designed and built in transmission plant. Physical effort in handling heavy parts has been minimized.

90. Build-Up in Steel

STEEL's recent special report entitled "Build-Up in Steel" can now be obtained in reprint form. This report reveals the steel ingot and pig iron capacities by plants as of Jan. 1, 1952, along with Jan. 1, 1951 figures for comparative purposes. It also shows what expansions are under way now or are projected.

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States
—POSTAGE WILL BE PAID BY—
STEEL
Penton Building
Cleveland 13, Ohio
Business Service Dept.

| | | |

ers more than half of the socket and assures accurate lampholder spacing.

Silicone Base Water Repellent

USE REPLY CARD—CIRCLE No. 24

A silicone base water repellent, developed by Ranetite Mfg. Co. Inc., St. Louis, Mo., is for surface application to masonry exterior. It may be applied by brushing or spraying at temperatures as low as freezing. It is clear and invisible and causes no change in masonry appearance.

Carbide Rivet Sets

USE REPLY CARD—CIRCLE No. 25

A series of carbide rivet sets and heading dies is introduced by Radius Tool Co., Elgin, Ill. They prevent galling in the process of rivet setting and metal flows evenly with less pressure required because of the hardness and mirror finish of the carbide. Rivet sets may be used on spinning, vibrating or impact-type machines.

Line Type Purifier

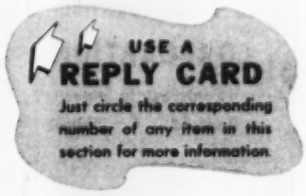
USE REPLY CARD—CIRCLE No. 26

Type LC Hi-eF line type purifier, announced by V. D. Anderson Co., Cleveland 2, O., is for use on small pipelines from $\frac{1}{2}$ to 2 inches. Applications include cleaning up steam processing lines, protecting small engines, turbines and regulating equipment from pipe scale and other solids and removing entrainment from vapor lines.

Steam Trap

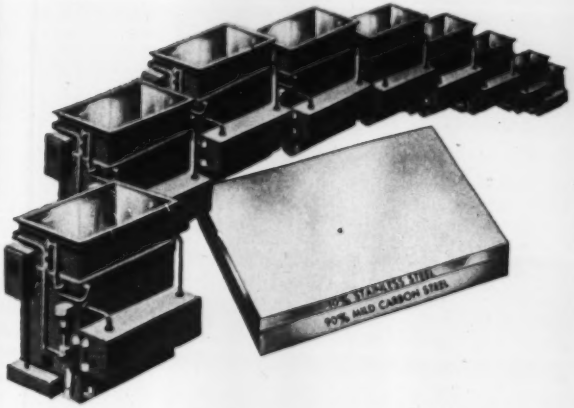
USE REPLY CARD—CIRCLE No. 27

Designed for processing industries where continuous uninterrupted operation is essential, a by-pass steam trap is offered by Velan Engineering Co., Jersey City, N. J. Two valves are incorporated in the trap and have a signalling device to indicate in which position the valves are. Draining device can be completely closed; steam and condensate can be bypassed.



How to Make Stainless Protection Go NINE TIMES FURTHER... with PERMACLAD

STAINLESS CLAD STEEL



Want stainless protection for your product or equipment—without wasting stainless steel? You'll get it at low cost—with PERMACLAD!

A 10% layer of stainless, inseparably welded to a 90% mild steel backing, gives PERMACLAD the surface characteristics of solid stainless *and* the easy forming qualities of carbon steel. This means real savings in corrosion resistance and in fabrication as well. For you can cold-form PERMACLAD with ease, draw it deeper without intermediate annealing, actually form it into products impossible with many other materials.

Even with the most severe draw, the percentage of cladding (which can be 20% or more if desired) never varies. And the stainless layer remains inseparably welded to its backing. For gleaming, stainless products and corrosion resistant equipment, design and build with PERMACLAD. The coupon below brings you full details in our new 8-page folder (P-85).

Send for Free Folder Today

FOR BETTER PRODUCTS AT LOW COST . . . SPECIFY PERMACLAD

A.W. PERMACLAD
STAINLESS CLAD STEEL

ALAN WOOD STEEL COMPANY Conshohocken, Pa.

Over 125 Years of Iron and Steel Making Experience

Gentlemen:
I am interested in stainless protection with PERMACLAD.
Please send me full information and new, free folder (P-85).

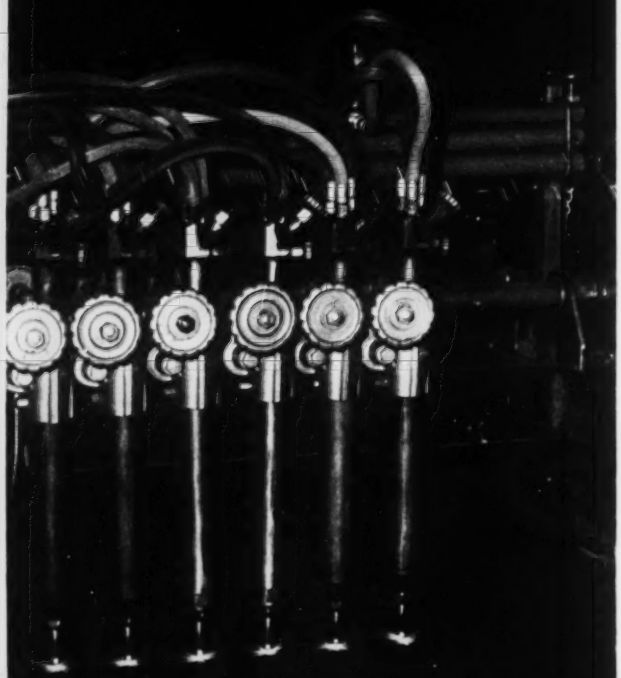
Name _____ *Title* _____

Company _____

Address _____ *City* _____ *State* _____

Other Products: A.W. ALGRIP ABRASIVE Floor Plate • A.W. SUPER-DIAMOND Floor Plate • Plates • Sheets • Strip • (Alloy and Special Grades)

. . . so we built a plate slitter!



As builders of special machinery and fabricators of welded machinery parts, we work with steel plates and bars of all sizes.

For production efficiency and economy, we decided to cut wide stock plates to our specifications. We needed a machine to make straight, square cuts in plates too thick to shear, and **we couldn't find standard equipment to fill all our requirements . . .**

. . . so we built a plate slitter!

Our new unit is completely adjustable for width, length, depth and speed of cut . . . has centralized controls for one-man operation . . . features width tolerance of $\frac{1}{16}$-inch . . . makes eight simultaneous cuts to reduce production cost and minimize warpage . . . has an auxiliary cross-cut torch to reduce material handling . . . and **has paid for itself many times.**

While your needs may not include a plate slitter, we are prepared to help engineer your product or to fabricate a difficult component. We are as near as your telephone.

Call us at BEdford 2-2500.

This precision plate slitter was developed to solve two of OUR problems . . . production costs and inventory.
As custom engineering and fabricating specialists, we can help with YOUR production problems . . . the tough ones.

LEWIS

THE LEWIS WELDING & ENGINEERING CORPORATION
15 Interestate Street
Bedford • Ohio

575-LW

The Market Outlook

THIS is one time that possibility of a steelworkers' strike didn't have any appreciable effect on metalworking companies' steel inventories. There are two reasons for the absence of the protective buying that usually accompanies steel industry wage negotiations—government rationing of steel, and increased caution toward inventories.

Even if a buyer wanted to lay in some protective tonnage he could buy only to the limits of his Controlled Materials Plan tickets. This situation demonstrated how continuation of controls beyond the point where they are needed would prevent metalworking plants from taking prudent steps to maintain operations.

INVENTORY MINDED—Even in the face of a strike threat, consumers in civilian goods industries without substantial defense contracts have been growing increasingly inventory minded. Orders for inventory adjustment are coming from top levels. In some cases, purchasing men, influenced by controls, apparently committed their companies for more tonnage than current backlogs and outlook warrant.

Some tonnage on order is being canceled or deferred, and in some sectors new buying is off. The large steel producers have enough tonnage booked to plug gaps generally for full schedules in the second quarter, but some of the smaller producers and premium price mills have not.

A THAW—Because there has been some easing in the over all demand for steel, Manly Fleischmann, Defense Production Administrator, announced last week that a substantial quantity of controlled materials, particularly structural steel, will be made available for new starts in the field of industrial and commercial construction in the third and fourth quarters of 1952. Not long ago, structural shapes were considered to be one of the tightest products.

Another one of the products that has been in tight supply, galvanized sheets, shows signs of becoming more plentiful. The National Production Authority expects March output of them to be from 165,000 to 170,000 tons and the April production to continue up to 200,000 tons because of an improved supply of zinc.

CONFIDENT—Most large mills did not appear much concerned about their ability to sustain a high rate of carbon sheet and strip output in the second quarter. While cold-rolled carbon sheets have been among the products in best supply the easing has been felt the most keenly by premium price sellers.

Light gage carbon plates from continuous sheet mills are in somewhat easier supply, but you can find consumers who would like to have even more of them than they now are getting. Heavy gage plates from conventional plate mills continue in very tight supply.

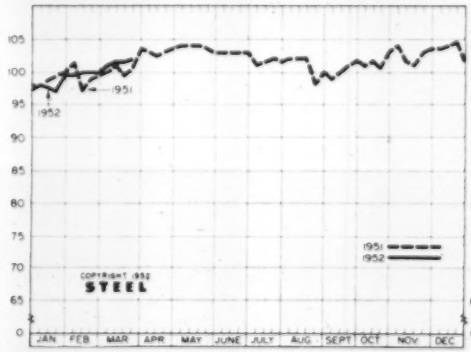
Bars, too, continue among the tightest products in supply, although some consumers' inventories of them are improved, as attested by a rise in shipments of goods dependent on bars, particularly small and intermediate sizes. Tightness in supply of larger size bars stems from their use in munitions.

SIGN OF THE TIMES—Warehouse inventories are improving, although there are still many cases of unbalanced stocks. Warehouse salesmen are out pushing some of the more plentiful products, and sales efforts have been intensified in one district sufficiently to bring a report that "more consumers are being taken to lunch by distributors' salesmen."

Steelmaking operations at the beginning of last week were scheduled for a new tonnage record, but a strike threat prompted producers to begin curtailing some of their operations by midweek. STEEL's national steelmaking rate, subject to revision, advanced ½ point to 102 per cent of capacity.

Except for some price shading through freight absorption by a few warehouses, especially on sheets and merchant pipe, steel and related product prices are unchanged at ceiling levels. Shading of $2 to $4 a ton under the ceiling price continues on cast iron scrap, but prices on the steelmaking grades continue steady, although some mills are modestly improving scrap inventories.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Mar. 22	Change	Same Week 1951	Same Week 1950
Pittsburgh	104.5	+ 2.0*	91	93
Chicago	103.5	— 2.0*	107	89
Mid-Atlantic	98	0	100.5	83
Youngstown	103	+ 1.0	106	80
Wheeling	99.5	— 1.5	97	100
Cleveland	100.5	+ 2.5	103.5	95
Buffalo	104	0	104	104
Birmingham	102	— 2	100	87
New England	85	+ 5.0	90	80
Cincinnati	91.5	0	104	98
St. Louis	84	+ 5	97	84.5
Detroit	106	+ 4.5*	101.5	104
Western	101	— 2.0	102	86
Estimated national rate	102	+ 5	100.5	90

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 31 Production-Engineering News—p. 67

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Mar. 20 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av. = 100)	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	28.00

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Mar. 20 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R. del. Philadelphia	4.223	4.223	4.223	4.18	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia	3.918	3.918	3.918	3.90	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.85-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ½"-⅝", Pitts.	4.10-30	4.10-30	4.10-30	4.10-30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.39	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Del. Phila.	57.11	57.11	57.11	56.89	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.58	34.75
Malleable Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$44.00	$45.00	$28.00
No. 1 Heavy Melt. E. Pa.	42.50	42.50	42.50	43.50	40.00
No. 1 Heavy Melt. Chicago	42.50	42.50	42.50	43.50	36.00
No. 1 Heavy Melt. Valley	44.00	44.00	44.00	45.00	38.00
No. 1 Heavy Melt. Cleve.	43.00	43.00	43.00	44.00	37.50
No. 1 Heavy Melt. Buffalo	43.00	43.00	43.00	44.00	40.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	41.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	43.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connisvl.	$14.75	$14.75	$14.75	$14.75	$8.75-$9
Beehive, Fdry. Connisvl.	17.50	17.50	17.50	17.50	9.75-11.00
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	134.00	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	50.00	42.00	28.25
Nickel, refinery, duty paid	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham R9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.50	58.00	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	62.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Mar. 20, 1952; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $79.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R7 ... $54.00
Fontana,Calif. K1 ... 80.00
Houston,Tex. S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 75.00
Gary,Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 69.00
Ensley,Ala. T2 ... 66.00
Fairfield,Ala. T2 ... 66.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 66.00
Geneva,Utah C11 ... 66.00
Houston,Tex. S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 85.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 85.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O.(2)* T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 89.00
Gary,Ind. U5 ... 70.00
Houston,Tex. S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00*
Lackawanna,N.Y. B2 ... 70.00
LosAngeles B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 103.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $89.00

SKELP
Aliquippa,Pa. J5 ... $3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown R2, U5 ... 3.35

WIRE RODS
Alton,Ill. L1 ... 4.40
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston,Tex. S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
No.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So.Chicago,Ill. R2 ... 4.20
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(1) N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester,Mass. A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah C11 ... 3.65
Houston,Tex. S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
Los Angeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22) P1 ... 4.85
Phoenixville,Pa. P4 ... 5.90
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.55
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa. (14) B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana,Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah C11 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Ind.Harbor,Ind. Y-1 ... 6.00
Johnstown,Pa. B2 ... 5.50
Lackawanna,N.Y.(14) B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So.Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.65
Fontana,Calif.(30) K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah C11 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y-1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.9-
Seattle B3 ... 6.55
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Warren,O. R2 ... 5.65
Youngstown Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. L7 ... 5.25
Conshohocken,Pa. A3 ... 5.05
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Ind.Harbor,Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago,Ill. U5 ... 4.75

PLATES, Inset Iron
Ashland,c.l. (15) A10 ... 3.95
Ashland,lcl (15 A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky. (15) A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. L7 ... 4.15
Conshohocken,Pa. A3 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. (30) K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah C11 ... 3.70
Harrisburg,Pa. C5 ... 6.30
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.50
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Seattle B3 ... 4.60
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5 W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. R2 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A.B.
Fontana,Calif. K1 ... 5.45
Geneva,Utah C11 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Alton,Ill. L1 ... 4.15
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2 Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.20
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.85
So.Chicago R2, U5, W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFran.,Cal. B3 ... 4.45
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ... 3.70
Atlanta A11 ... 4.25
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.65
SanFrancisco 87 ... 4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(2*), T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit, R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.35
Gary,Ind. U5 ... 4.30
Houston,Tex. S5 ... 4.70
Ind.Harbor,Ind. I-2 Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
KansasCity,Mo. S5 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2, U5, W14 ... 4.30
So.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary,Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H.R.,
High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.55
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif. K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
So.SanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.55
BeaverFalls,Pa. M12 R2 ... 4.55
Buffalo, B5 ... 4.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 4.55
Chicago W18 ... 4.55
Cleveland A7, C20 ... 4.55
Detroit P17 ... 4.70
Donora,Pa. A7 ... 4.55
Elyria,O. W8 ... 4.55
FranklinPark,Ill. N5 ... 4.55
Gary,Ind. R2 ... 4.55
GreenBay,Wis. F7 ... 4.55
Hammond,Ind. L2 M13 ... 4.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 4.55
LosAngeles R2 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 4.55
Monaca,Pa. S17 ... 4.
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 4.55
Struthers,O. Y1 ... 4.55
Waukegan,Ill. A7 ... 4.55
Youngstown F3, Y1 ... 4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.80
Canton,O. R2 ... 5.40
Canton,O.(2)* T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Cleveland C20 ... 5.40
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. L2 M13 ... 5.40
Hartford,Conn. R2 ... 5.85
Harvey,Ill. B5 ... 5.45
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2, R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Waukegan,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
ChicagoHts.(4) C2 ... 4.75
ChicagoHts.(3,4) I-2 ... 4.75
Franklin,Pa. (3,4) F5 ... 4.75
FortWorth,Tex.(26) T4 ... 4.85
Huntngtn,W.Va.(3) W7 ... 5.50
Marion,O.(3) P11 ... 4.75
Moline,Ill.(3) R2 ... 3.80
Tonawanda(3,4) B12 ... 4.75
Williamsport(3) S19 ... 5.00
Williamsport(4) S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 ... 15.00
Dover,(Eng.Bolt) U1 ... 13.50
Dover,(Wrgh.Iron) U1 ... 12.25
Economy,Pa.(8 R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt)L5 ... 14.50
McK.Rks.(8 R.) L5 ... 9.60
McK.Rks.(D.R.) L5 ... 13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2 Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.55
Minnequa,Colo. C10 ... 4.35
Niles,Calif. P1 ... 5.05
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.60
Sharon,Pa. S3 ... 4.00
So.Chicago,Ill. W14 ... 3.60
SparrowsPoint,Md. B2 ... 3.60
Steubenville,O. W10 ... 3.60
Torrance,Calif. C11 ... 4.30
Warren,O. R2 ... 3.60
Weirton,W.Va. W6 ... 3.60
WestLeechburg,Pa. A4 ... 3.75
Youngstown U5, Y1 ... 3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover,O. R1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14) ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.65
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
Ind.Harbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35) B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.40
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ... 6.65
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.05
IndianaHarbor,Ind. I-2 ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.00
Ind Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

Alabama City,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
Martins Ferry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.80

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
Granite City,Ill. G4	5.35
Ind Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
Granite City,Ill. G4	6.45
Ind Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
Granite City,Ill. G4	6.05
Ind Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert

No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
Indiana Harbor 1-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	
Martins Fy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	
Sparrows Pt. B2	5.60	
Torrance,Cal. C11	6.35	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
Granite City,Ill. G4	7.35	7.60	8.00
Ind Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R (22 Ga.) COILS (Cut Lengths 1/2c lower)

	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W.Va. W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
Granite City,Ill. G4 (cut lengths)	...	...	7.95	9.20	...
Ind Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1/2c lower) Transformer Grade

	72	65	58	52
Beechbottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American 1.25 Coke (Base Box)

	lb	lb	lb
Aliquippa,Pa. J5	$8.45	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.55	8.80
Gary,Ind. U5	8.45	8.45	8.70
Ind Har. I-2, Y1	8.45	8.45	8.70
Irvin,Pa. U5	8.45	8.45	8.70
Pitts.,Cal. C11	9.20	9.45	9.45
Sp.Pt.,Md. B2	8.55	8.55	8.80
Warren,O. R2	8.45	8.45	8.70
Weirton,W.Va. W6	8.45	8.45	8.70
Yorkville,O. W10	8.45	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

Beech Bottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind Harb.,Ind. I-2	5.30
Indiana Harbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	5.95
Los Angeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.San Francisco(25) B3	6.05
SparrowsPoint,Md. B2	5.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeport,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
Kansas City,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
Los Angeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
San Francisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.San Francisco E3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
West Leechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
Kansas City,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	....	....
Detroit D2	5.60	6.65	7.25	....	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
Franklin Park,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
New Britn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
New Castle,Pa. B4	5.35	6.80	7.40	9.35	....
New Castle,Pa. E5	5.50	6.80	7.40	9.35	11.65
New Haven,Conn. D2	5.85	6.75	7.35	....	....
New York W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS; Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
New York W3	...	...	10.30	12.50	15.35

Midland,Pa. C18 ..... 5.85
New Britn,Conn.(10) S15 5.45
Sharon,Pa. S3 ..... 5.85
Youngstown U5 ..... 5.80

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeport,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Fontana,Calif. K1	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
Franklin Park,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
Los Angeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
New Britain(10) S15	5.35
New Castle,Pa. B4	5.35
New Castle,Pa.(40) E5	5.25
New Haven,Conn. D2	5.85
New Haven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Allan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeport, Conn. (10)	$15 10.75
Carnegie, Pa.	8 15 ..... 10.60
Cleveland	A7 ..... 10.60
Dover, O.	G6 ..... 10.50
Fontana, Calif.	K1 ..... 11.65
Harrison, N.J.	C18 ..... 10.60
Midland, Pa.	C18 ..... 10.60
NewBritn, Conn. (10)	$15 10.75
Pawtucket, R.I. (11)	N8 10.75
Pawtucket, R.I. (12)	N8 11.05
Sharon, Pa.	83 ..... 10.60
Worcester, Mass.	A7 ..... 10.30
Youngstown	C8 ..... 10.60

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8)	A10 ..... 3.75
Warren, O.	R2 ..... 4.10

STRIP, Cold-Rolled Ingot Iron

Warren, O.	R2 ..... 5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 ..... 4.05
Riverdale, Ill.	A1 ..... 3.90
Sharon, Pa.	83 ..... 4.15
Youngstown	U5 ..... 3.75

WIRE, Tire Bead

Bartonville, Ill. (1)	K4 ... 10.90
Monessen, Pa.	P16 ..... 11.40
Roebling, N.J.	R5 ..... 11.55

Wire, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity	R2 .. 5.70	5.95
Aliquippa	J5 ..... 5.70	6.15
Atlanta	A11 ..... 5.95	6.40
Bartonville (19)	K4 5.70	6.15
Buffalo	W12 ..... 4.85	...
Cleveland	A7 ..... 5.70	6.15
Crawfordsville	M8 5.95	6.40
Donora, Pa.	A7 .. 5.70	6.15
Duluth, Minn.	A7 .. 5.70	6.15
Fairfield	T2 ..... 5.70	6.15
Houston, Tex.	S5 . 6.10	6.55
Johnstown	B2 ... 5.70	6.15
Joliet, Ill.	A7 ..... 5.70	6.15
KansasCy. Mo.	S5 . 6.30	6.75
Kokomo	C16 ..... 5.80	6.05
LosAngeles	B3 ..... 6.65	...
Minnequa	C10 ..... 5.95	6.45
Monessen	P7 ..... 5.95	6.40
Palmer	W12 ..... 5.15	...
Pitts., Calif.	C11.. 6.65	6.80
Prtsmth. (18)	P12 .. 6.10	6.80
Rankin	A7 ..... 5.70	6.15
So. Chicago	R2 ..... 5.70	5.95
So. S. Fran.	C10 ... 6.65	7.10
SparrowsPt.	B2 ..... 6.25	6.25
Sterling, Ill. (1)	N15 .. 5.70	6.15
Struthers, O.	Y1 ..... 5.70	6.15
Torrance, Cal.	C11 6.65	...
Worcester	A7 ..... 6.00	6.45

ROPE WIRE

	(A)	(B)
Alton, Ill.	L1 ..... 8.65	8.90
Bartonville, Ill.	K4 8.55	8.80
Buffalo	W12 ..... 8.55	8.80
Fostoria, O.	S1 .. 8.85	9.10
Johnstown, Pa.	B2 8.55	8.80
Monessen, Pa.	P16 8.55	8.80
Monessen, Pa.	P7 .. 8.80	9.05
Palmer, Mass.	W12 . 8.85	9.10
Portsmouth, O.	P12 8.55	8.80
Roebling, N.J.	R5 .. 8.85	9.10
SparrowsPt.	B2 .. 8.65	8.90
Struthers, O.	Y1 .. 8.55	8.80
Worcester	J4, T6 . 8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity, Ala.	R3 ... 4.85
Aliquippa, Pa.	J5 ..... 4.85
Atlanta	A11 ..... 5.10
Alton, Ill.	L1 ..... 5.05
Bartonville, Ill. (1)	K4 ... 4.85
Buffalo	W12 ..... 4.85
Chicago	W13 ..... 5.10
Cleveland	A7, C20 ... 4.85
Crawfordsville, Ind.	M8 .. 5.10
Donora, Pa.	A7 ..... 4.85
Duluth, Minn.	A7 ..... 4.85
Fairfield, Ala.	T2 ..... 4.85
Fostoria, O. (24)	S1 ..... 5.35
Houston	S5 ..... 5.25
Johnstown, Pa.	B2 ..... 4.85
Joliet, Ill.	A7 ..... 4.85
KansasCity, Mo.	S5 ..... 5.45
Kokomo, Ind.	C16 ..... 4.95
LosAngeles	B3 ..... 5.80
Minnequa, Colo.	C10 ... 5.10
Monessen, Pa.	P7 ..... 5.10
Newark,	6-8 ga. I-1 .. 5.50
No. Tonawanda	B11 .... 4.85
Palmer, Mass.	W12 ..... 5.15
Pittsburg, Calif.	C11 ... 5.80
Portsmouth, O.	P12 ..... 5.25
Rankin, Pa.	A7 ..... 4.85
So. Chicago, Ill.	R2 ..... 4.85
So. SanFrancisco	C10 ... 5.80
SparrowsPoint, Md.	B2 .. 4.95
Sterling, Ill. (1)	N15 .... 4.85
Struthers, O.	Y1 ..... 4.95
Torrance, Calif.	C11 .... 5.80
Waukegan, Ill.	A7 ..... 4.85
Worcester, Mass.	A7, T6 . 5.15

WIRE, Cold-Rolled Flat

Anderson, Ind.	G6 ..... 6.20
Buffalo	W12 ..... 6.35
Cleveland	A7 ..... 5.85
Crawfordsville, Ind.	M8 . 6.20
Detroit	D2 ..... 6.20
Dover, O.	G6 ..... 6.20
Fostoria, O.	S1 ..... 6.00
Kokomo, Ind.	C16 ..... 5.70
FranklinPark, Ill.	T6 ... 6.20
Massillon, O.	R8 ..... 5.85
Monessen, Pa.	P16 ..... 5.85
Monessen, Pa.	P7 ..... 6.10
NewHaven, Conn.	D2 .. 6.50
Pawtucket, R.I. (12)	N8 . 8.85
Trenton, N.J.	R5 ..... 6.15
Worcester, Mass.	A7 ... 6.15
Worcester, Mass.	T6 ... 6.50
Worcester, Mass.	W12 .. 6.65

WIRE, Galv'd ACSR for Cores

Bartonville, Ill.	K4 ..... 8.50
Monessen, Pa.	P16 ..... 8.50
Roebling, N.J.	R5 ..... 8.80
SparrowsPoint, Md.	B2 .. 8.60
Johnstown, Pa.	B2 ..... 8.50

WIRE (16 gage)	An'l'd Stone	Galv. Stone
Aliquippa	J5 ..... 10.15	12.15
Bartonville (1)	K4 .. 10.25	11.95
Cleveland	A7 ..... 10.25	12.15
Crawfrdsville	M8 10.30	12.00
Fostoria, O.	S1 .. 10.40	13.00
Johnstown	B2 ... 10.25	12.15
Kokomo	C16 ... 10.25	11.95
Minnequa	C10 ... 10.40	12.40
Palmer, Mass.	W12 10.25	12.15
Pitts. Cal.	C11 ... 10.60	12.50
Prtsmth. (18)	P12 10.55	12.30
SparrowsPt.	B2 .. 10.35	12.25
Waukegan	A7 ... 10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa, Pa.	J5 ..... 6.25
Alton, Ill.	L1 ..... 6.45
Bartonville, Ill. (1)	K4 .. 6.25
Buffalo	W12 ..... 6.25
Cleveland	A7 ..... 6.25
Donora, Pa.	A7 ..... 6.25
Duluth, Minn.	A7 ..... 6.25
Fostoria, O.	S1 ..... 6.25
Johnstown, Pa.	B2 ..... 6.25
LosAngeles	B3 ..... 7.20
Milbury, Mass. (12)	N8 .. 8.05
Monessen, Pa.	P7, P16 . 6.25
Palmer, Mass.	W12 ..... 6.55
Pittsburg, Calif.	C11 ... 7.20
Roebling, N.J.	R5 ..... 6.55
Portsmouth, O.	P12 ..... 6.25
So. Chicago, Ill.	R2 ..... 6.25
So. SanFrancisco	C10 ... 7.20
SparrowsPoint, Md.	B2 .. 6.25
Struthers, O.	Y1 ..... 6.25
Trenton, N.J.	A7 ..... 6.55
Waukegan, Ill.	A7 ..... 6.25
Worcester, A7,	T6, W12 . 6.55
Worcester, Mass.	J4 ..... 6.75

WIRE, Fine & Weaving (8" Coils)

Bartonville, Ill. (1)	K4 ... 8.90
Buffalo	W12 ..... 8.90
Chicago	W13 ..... 8.90
Cleveland	A7 ..... 8.90
Crawfordsville, Ind.	M8 .. 8.95
Fostoria, O.	S1 ..... 8.90
Johnstown, Pa.	B2 ..... 8.90
Kokomo, Ind.	C16 ..... 8.90
Monessen, Pa.	P16 ..... 8.90
Palmer, Mass.	W12 ..... 9.20
Portsmouth, O.	P12 ..... 8.90
Roebling, N.J.	R5 ..... 9.20
Waukegan, Ill.	A7 ..... 8.90
Worcester, Mass.	A7, T6 9.20

WIRE, Barbed

	Col.
AlabamaCity, Ala.	R2 ... 137
Aliquippa, Pa.	J5 141
Atlanta	A11 144
Bartonville, Ill. (19)	K4 .. 144
Crawfordsville, Ind.	M8 .. 146
Donora, Pa.	A7 141
Duluth, Minn.	A7 141
Fairfield, Ala.	T2 141
Houston, Tex.	S5 149
Johnstown, Pa.	B2 141
Joliet, Ill.	A7 141
KansasCity, Mo.	S5 153
Kokomo, Ind.	C16 143
Minnequa, Colo.	C10 ... 147
Monessen, Pa.	P7 146
Pittsburg, Calif.	C11 ... 161
Portsmouth, O. (18)	P12 .. 148
Rankin, Pa.	A7 141
So. Chicago, Ill.	R2 137
So. SanFran., Calif.	C10 .. 161
SparrowsPoint, Md.	B2 ... 143
Sterling, Ill. (1)	N15 141

BALE TIES, Single Loop

	Col.
AlabamaCity, Ala.	R2 ... 123
Atlanta	A11 126
Bartonville, Ill. (19)	K4 .. 123
Crawfordsville, Ind.	M8 .. 132
Donora, Pa.	A7 123
Duluth, Minn.	A7 123
Fairfield, Ala.	T2 123
Joliet, Ill.	A7 123
KansasCity, Mo.	S5 131
Kokomo, Ind.	C16 125
Minnequa, Colo.	C10 ... 128
Pittsburg, Calif.	C11 ... 147
So. Chicago, Ill.	R2 123
So. SanFran., Calif.	C10 .. 147
SparrowsPoint, Md.	B2 ... 125
Sterling, Ill. (1)	N15 123

WIRE, Upholstery Spring

Aliquippa, Pa.	J5 ..... 5.90
Alton, Ill.	L1 ..... 6.10
Buffalo	W12 ..... 5.90
Cleveland	A7 ..... 5.90
Donora, Pa.	A7 ..... 5.90
Duluth, Minn.	A7 ..... 5.90
Johnstown, Pa.	B2 ..... 5.90
LosAngeles	B3 ..... 6.85
Monessen, Pa.	P7, P16 . 5.90
NewHaven, Conn.	A7 ..... 6.20
Palmer, Mass.	W12 ..... 6.20
Pittsburg, Calif.	C11 ..... 6.85
Portsmouth, O.	P12 ..... 5.90
Roebling, N.J.	R5 ..... 6.20
So. Chicago, Ill.	R2 ..... 5.90
So. SanFrancisco	C10 ... 6.85
SparrowsPoint, Md.	B2 .. 6.00
Torrance, Calif.	C11 .... 6.85
Trenton, N.J.	A7 ..... 6.20
Waukegan, Ill.	A7 ..... 5.90
Worcester, Mass.	A7 ..... 6.20

WOVEN FENCE, 9-15½ Ga.

	Col.
AlabamaCity, Ala.	R2 ... 127
Ala. City, Ala., 17-18 ga.	R2 214
Aliquippa, Pa.	9-14½ ga. J5 131
Atlanta	A11 134
Bartonville, Ill. (19)	K4 .. 131
Crawfordsville, Ind.	M8 .. 133
Donora, Pa.	A7 131
Duluth, Minn.	A7 131
Fairfield, Ala.	T2 131
Houston, Tex.	S5 139
Johnstown, Pa.	B2 131
Johnstown, 17 ga., 6"	B2 .. 208
Johnstown, 17 ga., 4"	B2 .. 208
Joliet, Ill.	A7 131
KansasCity, Mo.	S5 143
Kokomo, Ind.	C16 133
Minnequa, Colo.	C10 ... 139
Monessen, Pa.	P7 136
Pittsburg, Calif.	C11 154
Portsmouth, O. (18)	P12 .. 138
Rankin, Pa.	A7 131
So. Chicago, Ill.	R2 127
Sterling, Ill. (1)	N15 131

FENCE POSTS

ChicagoHts., Ill.	C2 140
Duluth, Minn.	A7 125
Franklin, Pa.	F5 140
Huntington, W.Va.	W7 140
Johnstown, Pa.	B2 140
Kansas City, Mo.	S5 140
Minnequa, Colo.	C10 130
Moline, Ill.	R2 136
So. Chicago, Ill.	R2 140
Tonawanda, N.Y.	B12 140
Williamsport, Pa.	S19 150

TRACK BOLTS (20) Treated

KansasCity, Mo.	S5 ..... 9.85
Lebanon, Pa. (31)	B2 ..... 9.85
Minnequa, Colo.	C10 ..... 9.85
Pittsburgh	O3, P14 ... 9.85
Seattle	B3 ..... 10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity, Ala.	R2 118
Aliquippa, Pa. (13)	J5 118
Atlanta	A11 121
Bartonville, Ill. (19)	K4 118
Chicago, Ill.	W13 118
Cleveland	A9 125
Crawfordsville, Ind.	M8 122
Donora, Pa.	A7 118
Duluth, Minn.	A7 118
Fairfield, Ala.	T2 118
Galveston, Tex.	D7 128
Houston, Tex.	S5 128
Johnstown, Pa.	B2 118
Joliet, Ill.	A7 118
KansasCity, Mo.	S5 130
Kokomo, Ind.	C16 120
Minnequa, Colo.	C10 123
Monessen, Pa.	P7 124
Pittsburg, Calif.	C11 137
Portsmouth, O.	P12 124
Rankin, Pa.	A7 118
So. Chicago, Ill.	R2 118
SparrowsPoint, Md.	B2 .. 120
Sterling, Ill. (1)	N15 118
Torrance, Calif.	C11 138
Worcester, Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken, Pa.	A3 .. $7.35
Wheeling, W.Va.	10 ..... 7.35

TIE PLATES

Fairfield, Ala.	T2 ..... 4.50
Gary, Ind.	U5 ..... 4.50
Ind. Harbor, Ind.	I-2 .... 4.50
Lackawanna, N.Y.	B2 .... 4.50
Minnequa, Colo.	C10 .... 4.50
Pittsburg, Calif.	C11 .... 4.65
Seattle	B3 ..... 4.65
Steelton, Pa.	B2 ..... 4.50
Torrance, Calif.	C11 .... 4.65

JOINT BARS

Bessemer, Pa.	U5 ..... 4.70
Fairfield, Ala.	T2 ..... 4.70
Ind. Harbor, Ind.	I-2 .... 4.70
Joliet, Ill.	U5 ..... 4.70
Lackawanna, N.Y.	B2 .... 4.70
Minnequa, Colo.	C10 .... 4.70
Steelton, Pa.	B2 ..... 4.70

STANDARD TRACK SPIKES

Ind. Harbor, Ind.	I-2, Y1 6.15
KansasCity, Mo.	S5 .... 6.40
Lebanon, Pa.	B2 ..... 6.15
Minnequa, Colo.	C10 .... 6.15
Pittsburgh	J5 ..... 6.15
Seattle	B3 ..... 6.65
So. Chicago, Ill.	R2 .... 6.15
Struthers, O.	Y1 ..... 6.15
Youngstown	R2 ..... 6.15

AXLES

Ind. Harbor, Ind.	S13 .... 5.60
Johnstown, Pa.	B2 ..... 5.60

RAILS

	Std. No. 1	Std. No. 2	All No. 2	60 lb Under
Bessemer, Pa.	U5	3.60	3.50	3.55	4.00
Ensley, Ala.	T2	3.60	3.50	...	4.00
Fairfield, Ala.	T2	...	...	...	4.00
Gary, Ind.	U5	3.60	3.50	3.55	...
Huntington, W.Va.	W7	...	...	...	5.90
Ind. Harbor, Ind.	I-2	3.60	3.50	3.55	...
Johnstown, Pa.	B2	...	...	(18)	4.00
Lackawanna, N.Y.	B2	3.60	3.50	...	4.00
Minnequa, Colo.	C10	3.60	3.50	...	4.50
Steelton, Pa.	B2	3.60	3.50	...	...
Williamsport, Pa.	S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.506
18	4	2	....		1.650
20	25	4.25	1 6	12.25	3.535-3.675
19	4	2	7		2.460
18	25	4.25	1	4.75	2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.8025
W	Cr	V	Mo		
6	4	1.9	5		0.96-0.985
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 23 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10-6% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 30c.
(34) 7.25c for cut lengths.
(35) 12" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 42" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

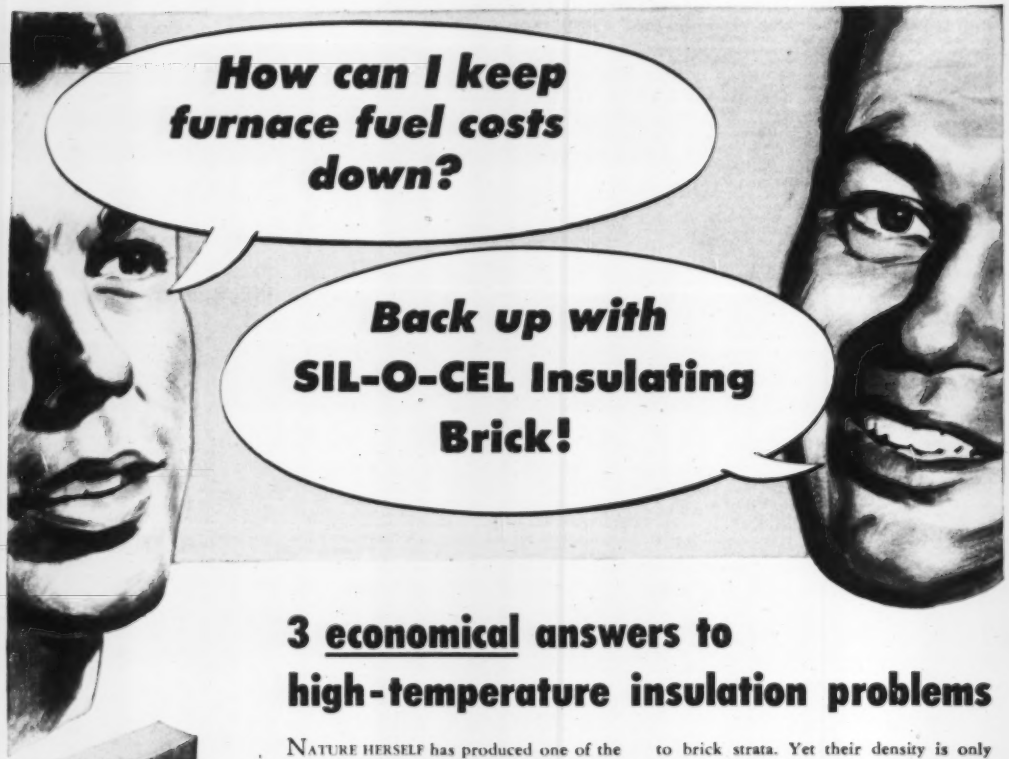
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Northwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

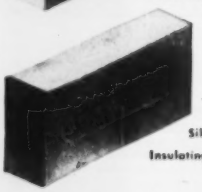
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv., EatonMfg.

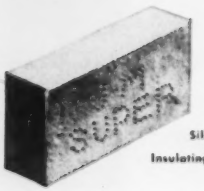
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube



3 economical answers to high-temperature insulation problems

Sil-O-Cel Natural Insulating Brick


Sil-O-Cel C-22 Insulating Brick



Sil-O-Cel Super Insulating Brick

NATURE HERSELF has produced one of the most effective high-temperature insulating materials ever discovered—diatomaceous silica, from which Sil-O-Cel® Insulating Brick are made.

These insulating brick are used for back-up insulation behind fire brick or insulating fire brick linings in boilers, stills, stacks, heat-treating furnaces, kilns, lehrs, flues, retorts, and other types of high-temperature equipment.

Sil-O-Cel Insulating Brick have excellent insulating qualities combined with high load-bearing characteristics and light weight.

Made in all standard shapes of the 2½ in. and 3 in. series, Sil-O-Cel Insulating Brick are produced in three basic types:

SIL-O-CEL NATURAL INSULATING BRICK
for temperatures to 1600F

Quarried directly from one of the world's purest deposits of diatomaceous silica, these insulating brick have a conductivity of only 0.79 Btu in./sq ft/F/hr at 1000F mean temperature, with heat flow perpendicular to brick strata. Yet their density is only 30 lb/cu ft. Cold crushing strength, 400 psi.

SIL-O-CEL C-22 INSULATING BRICK
for temperatures to 2000F

Ideal where high load-bearing properties are needed, this type of Sil-O-Cel is calcined, and has a cold crushing strength of 700 psi. Conductivity is 1.88 Btu in./sq ft/F/hr at 1000F mean temperature. Density, 38 lb/cu ft.

SIL-O-CEL SUPER INSULATING BRICK
for temperatures to 2500F

A calcined insulating brick for unusually high temperatures. In many cases, it is also possible to save on construction costs by reducing the thickness of fire brick or insulating fire brick when backed with Sil-O-Cel Super Insulating Brick. Conductivity is 1.95 Btu in./sq ft/F/hr at 1000F mean temperature. Density, 40 lb./cu. ft. Cold crushing strength, 300 psi.

For further information, write to Johns-Manville, Box 290, New York, N. Y. In Canada, write 199 Bay St., Toronto 1, Ont.

JOHNS MANVILLE JM PRODUCTS

Johns-Manville *first in* **INSULATIONS**

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.68	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Columns A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ¼-⅜", F6; Benwood, W. Va., 3½ points lower on ½", 1½ points lower on ¾", and 2 points lower on ⅝", W10; Sharon, Pa. M6, 1 point higher on ¼", 2 points lower on ¾" and ⅝"; Wheatland, Pa. W9, 2 points lower on ¼", ¾", ⅝". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ¼-⅝"; Benwood, W. Va. W10, except plus 4% on ¼", plus 6% on ⅜", plus 13½ on ½" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅝", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ¼", ⅜", ⅝"; 1 point lower on ½", 2 points lower on 1", 1½", 2" 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.78
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	...	...	...	...	19.75	26.24-27.50	77.00
304	25.00	29.50	...	...	24.50	27.50-27.77	77.00
309	30.50	35.00	...	...	...	...	...
310	36.50	41.00	...	...	...	...	144.00
316	29.50	34.00	...	...	26.00	35.92-36.50	...
317	34.50	39.00	...	...	...	...	...
318	33.50	38.00	...	...	...	...	...
321	26.50	31.00-32.00	...	...	23.00	33.00	111.00
347	27.50	32.00	...	...	24.00	33.50-33.83	130.00
405	21.25	27.75	...	...	...	...	...
410	20.75	27.25	...	...	...	...	...
Nickel	33.55	43.15	41.00	54.00	...	...	...
Inconel	41.23	54.18	...	...	...	...	165.00
Monel	34.93	46.28	...	...	...	...	...
Copper*	...	...	23.70†	29.65‡	...	...	...

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Coatsohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.	23
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy.
½-in. & smaller	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1½-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex.	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1½-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex.	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1¼-in.	19.5 12
1⅜-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg. Hvy.
½-in. & smaller	35 28.5
⅝-in. & ¾-in.	29.5 22
⅞-in.-1½-in.	24 15
1⅛-in. & larger	13 8.5
	Light
½-in. & smaller	35
⅝-in. to ⅞-in.	28.5
1-in. to 1½-in.	26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. of shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.50c

7/16-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers....List to list-plus

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%... $43; 60%... $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg. ..26.00-33.00

Industrial xylol ..25.00-33.50

Per ton bulk ovens

Sulphate of ammonia $32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots, New York, 82 bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe, Unannealed 99+% Fe (minus 325 Fe	42.50 36.50
Unannealed, 99+% Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	25.00-32.50
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh; 1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 65 mesh; 1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum:	
99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr. min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	17.00-18.00
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

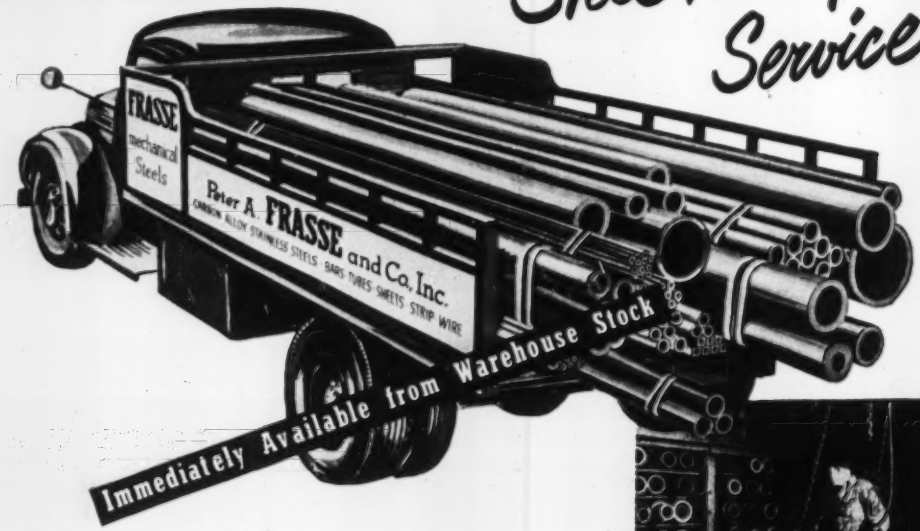
OVEN FOUNDRY COKE

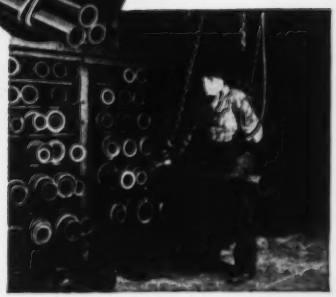
Kearney, N. J. ovens	$22.75
Everett, Mass., Ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Nevillelsland Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

FRASSE

for COMPLETE Steel Tubing Service





Seamless and Welded Mechanical Tubing

Aircraft Tubing

Condenser, Hydraulic and Pressure Tubes

Stainless Tubing—Seamless and Welded,
Stainless Pipe, Valves and Fittings

SAVE TIME: *Call FRASSE 1st*

Peter A. FRASSE and Co., Inc.

NEW YORK 13, N.Y.	PHILADELPHIA 29, PA.	BUFFALO 3, N.Y.	SYRACUSE 1, N.Y.
17 Grand St.	3911 Wissahickon Ave.	50 Exchange St.	P.O. Box 1267
WAlker 5-2200	*BAldwin 9-9900*	*WAshington 2000*	*SYracuse 73-5241*

LYNDHURST HARTFORD BALTIMORE ROCHESTER

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.40	7.11	8.55	7.05	....	6.49	7.29	9.28	6.37	6.74	7.98
JerseyCity(c'try)	6.10	6.91	8.25	6.75	....	6.19	6.99	8.98	6.07	6.44	7.68
Boston (city)	6.40	7.18	8.83	6.35	....	6.25	7.04	9.00	6.40	6.83	7.84
Boston (c'try)	6.20	6.98	8.63	6.15	....	6.05	6.84	9.20	6.20	6.63	7.64
Phila. (city)	6.04	6.97	8.35	6.33	7.11	6.27	7.16	8.97	6.09	6.30	7.29
Phila. (c'try)	5.79	6.72	8.10	6.08	6.86	6.02	6.91	8.72	5.84	6.05	7.04
Balt. (city)	5.74	7.00	8.40	6.23	....	6.21	6.83	....	6.33	6.33	7.57
Balt. (c'try)	5.54	6.80	8.20	6.03	....	6.01	6.63	....	6.13	6.13	7.37
Norfolk, Va.	6.78	....	....	....	....	6.04	7.30	....	6.30	6.30	7.15
Richmond, Va.	5.74	6.57	8.38	6.14	....	5.91	6.59	....	6.72	6.86	8.00
Wash. (w'hse)	6.05	7.26	8.49	6.50	....	6.50	7.26	....	6.60	6.65	7.86
Buffalo (del.)	5.74	6.52	8.29	6.06	....	5.72	6.65	10.65††	6.00	6.23	7.55
Buffalo (w'hse)	5.54	6.32	8.09	5.86	....	5.52	6.45	10.45††	5.80	6.03	7.35
Pitts. (w'hse)	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse)	5.75	6.47	8.12	5.76	7.15	5.76	6.64	9.13	6.09	5.88	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.18	5.76	6.60	8.91	6.15	6.02	7.40
Cleve. (w'hse)	5.54	6.32	7.96	5.65	6.98	5.56	6.40	8.71	5.95	5.82	7.20
Cincin. (w'hse)	5.84	6.38	8.29	5.77	....	5.75	6.64	....	6.09	6.14	7.28
Chicago (city)	5.74	6.52	8.05	5.69	....	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	....	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city)	5.90	....	8.21	5.85	....	5.83	6.88	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	....	8.01	5.65	....	5.63	6.68	10.26††	5.81	5.86	7.05
St. Louis (del.)	6.02	6.80	8.33	6.56	....	5.93	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse)	5.82	6.60	8.13	6.36	....	5.73	6.68	10.38	6.02	6.07	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	....	6.35	7.20	....	6.50	6.60	7.80
Kans.City(w'hse)	6.20	7.00	8.20	6.15	....	6.15	7.00	....	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90§	5.70	....	5.70	7.53	....	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75§	5.55	....	5.55	7.53	....	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30¶	9.45	6.60	10.65	6.45	8.35	....	6.50	6.50	8.75
L. A. (w'hse)	6.30	8.10¶	9.25	6.40	10.45	6.25	8.15	....	6.30	6.30	8.55
Seattle-Tacoma	7.02	8.64	9.60	7.54	....	6.70	9.19	10.35	6.54	6.90	8.73
San Francisco	6.64	7.88§	8.85§	6.43	....	6.72	8.20	11.15	6.45	6.50	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ¶—500 to 1499 lb; §—450 to 1499 lb; ‖—3500 lb and over; ⁶—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight, differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244, f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese, Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lots 36.25c; less ton lots 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lots 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $193 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30% max.; ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcas Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 151, Mar. 17 issue, calcium, zirconium and briquetted alloys, page 167, Mar. 3. Refractories prices also were published on page 167, Mar. 3 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952

STEELMAKING SCRAP COMPOSITE

Mar. 20	$43.00
Mar. 13	43.00
Feb. 1952	43.00
Mar. 1951	44.00
Mar. 1947	37.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin, and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00
Elec. Furnace and Fdry. Grades	
11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restriction on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, of 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses, otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.

Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa. 53c; Buffalo, 83c; Butler, Pa., 65c.

Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.

Coatesville, Pa., 50c; Conshohocken, Pa., 20c.

Detroit, 95c; Duluth, Minn., 50c.

Harrisburg, Pa., 51c; Houston, 57c.

Johnstown, Pa. 75c.

Kansas City, Mo., 78c; Kokomo, Ind., 51c.

Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 36c; Monessen, Pa., 51c.

Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.

St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O. 51c.

Warren, Pa., 75c; Weirton, 70c.

Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

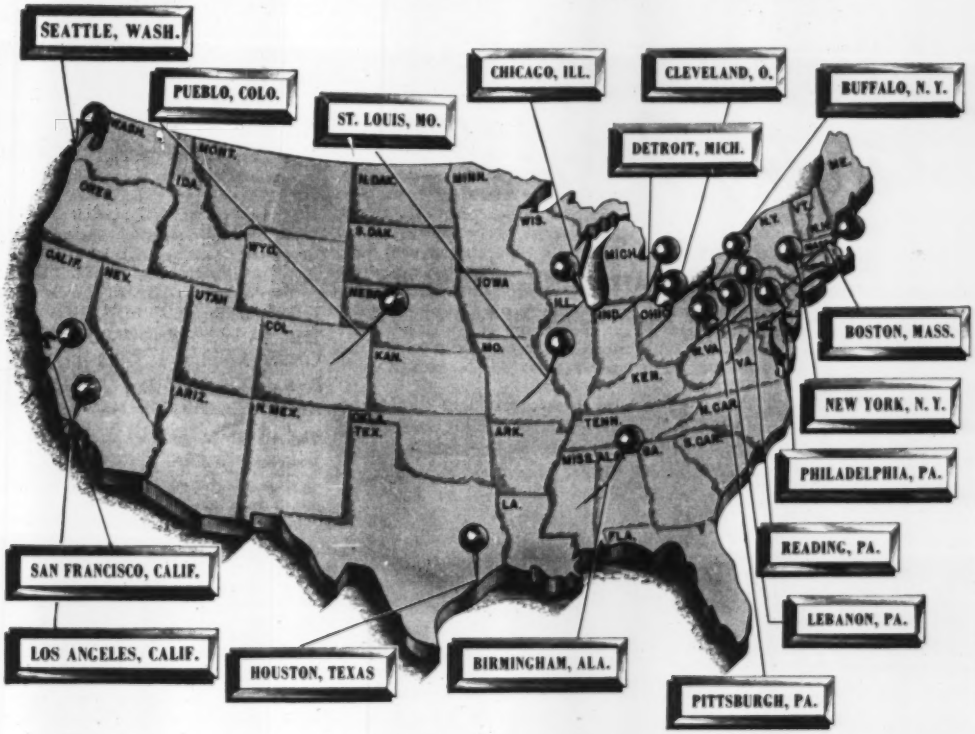
Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.o.b. shipping point.

For the Purchase or Sale of

Iron and Steel Scrap . . .

CONSULT OUR NEAREST OFFICE



The energy and integrity of our organization is ready to serve your best interests . . .

Since 1889, Luria Brothers & Company, Inc. have made fair dealings their constant aim.

LURIA BROTHERS AND COMPANY, INC.

PLANTS

LEBANON, PENNA.
READING, PENNA.
DETROIT (ECORSE), MICHIGAN
MODENA, PENNA.
PITTSBURGH, PENNA.
ERIE, PENNA.

MAIN OFFICE

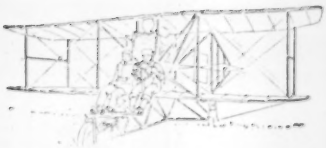
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

OFFICES

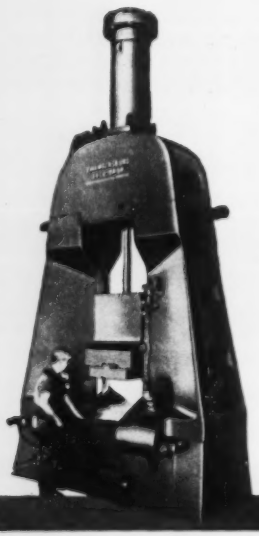
BIRMINGHAM, ALA. Empire Building	CLEVELAND, OHIO 1022 Midland Bldg.	LOS ANGELES, CAL. 3440 Wilshire Blvd.	READING, PENNA. Luria Building
BOSTON, MASS. Statler Building	DETROIT, MICH. 2011 Book Building	NEW YORK, N. Y. 100 Park Avenue	ST. LOUIS, MO. Railway Exch. Bldg.
BUFFALO, N. Y. Genesee Building	HOUSTON, TEXAS 1114 Texas Av. Bldg.	PITTSBURGH, PA. Oliver Building	SAN FRANCISCO, CAL. 300 Montgomery St.
CHICAGO, ILLINOIS 100 W. Monroe St.	LEBANON, PENNA. Luria Building	PUEBLO, COLORADO 334 Colorado Bldg.	SEATTLE, WASH. Smith Tower

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Flying Forgings—



THE MODERN AIRPLANE IS LARGELY MADE UP OF HAMMERED METAL PARTS



IT is hard to associate flight through the air,—the flight of birds, the flight of planes — with weight, strain, stress, impact; yet the greater the size of the plane, the higher the speed, the heavier the load, the greater become the forces tending to pull it apart. That is why the toughness and strength of the metal parts that make up the modern plane are so important, why drop forgings and hammered sheet metal parts are essential in airplane construction — why the hammers built by Chambersburg are busy night and day in the aircraft industry, as in all other manufacturing industries which use metal parts that must not fail.

THERE WERE FEW FORGINGS IN THE BAMBOO-AND-VARNISHED-LINEN AIRPLANE OF 1911 BUT EVEN THEN THE PRIMITIVE AIRPLANE ENGINE HAD THEM

The original Wright plane that went into production—the Model B—had a high speed of 42 m.p.h., carried 2 people, had a little over 2 hours gasoline supply and a service ceiling at full load of about 8000 feet.

Today's plane—41 years later—has a high speed of 600 m.p.h., carries 125 passengers, has enormous gas capacity and ceilings up to 50,000 feet.

Tomorrow's plane, says Grover A. Loening, may cruise at 1200 to 1500 m.p.h. (N.Y. to Europe in 3 hours, California in 2 hours, Florida in 45 minutes) may land almost vertically and may be fireproof in crashes. And it, too, will be built largely of hammered metal parts.

CHAMBERSBURG ENGINEERING CO. · CHAMBERSBURG, PENNA.

CHAMBERSBURG

THE HAMMER BUILDERS

The Metal Market

Price softening abroad is good news for domestic fabricators as low point in metals supply may be passed already. Indonesian tin settlement may have bandwagon effect

WEAKENING PRICES in foreign markets foreshadow further easing of metals supplies to American fabricators.

Tangible relief won't be seen by manufacturers immediately, of course. But the price softening means the worst of the shortages could soon be past.

Bandwagon—Prices of most major metals are or should soon be in a downward drift toward U. S. ceilings. From this softening comes extra ammunition for those who would hasten decontrol. Fast relaxation of use restrictions on some scarce-turned-plentiful metals may be a tipoff on future government action. In six months many more currently tight metals could join the parade toward plenty.

With first signs of easing, more than normal amounts of metal generally come forth. One reason is the bandwagon effect on suppliers. Another is that speculators' stocks can be shaken loose quickly by a price reversal.

Sword and Shield—A weapon of great potency in dealing with foreign suppliers of metals is the national stockpile. It's getting extensive use as a sword as well as a shield in setting prices abroad.

The Indonesian tin contract is a good example. RFC was adamant in its refusal to go above the price negotiated between Winston Churchill and President Truman for Malay tin. Reason: Any price increase negotiated with the Indonesians would automatically accrue to the British.

The Commitment — In the agreement reached last week, Indonesia will sell 18,000 tons annually to the U. S. at $1.18 per pound at Jakarta, or $1.215 in New York. Two-thirds of the shipments in the first two years will be concentrates.

The contract provides that during the second year renegotiation of price for the third year will be mandatory, taking into consideration prevailing market conditions. Should production fall below 18,000 tons a year, Indonesia will deliver 58 per cent of output to this country.

Handwriting—With this settlement comes promise of others. Belgian and Bolivian tin producers may see the handwriting on the wall and reach an agreement soon. If the tin deadlocks can be broken completely, domestic users will benefit substantially and soon, because sizable stocks are now piled up abroad.

More Zinc for Galvanizers

Galvanizers will get more generous allocations of zinc in April. They'll be able to turn out a minimum 200,000 tons of galvanized sheets, about 30,000 to 35,000 tons more than the March output. Galvanized pipe producers should benefit proportionately. Brass mills won't, though; they'll get all the zinc they can use with the copper allocated to them, but copper is the determining factor. Copper allocations to brass mills will be increased in the second quarter, but not substantially. Better balance should come by the third quarter, NPA says.

Foreign zinc is not a factor in the present supply situation—but it soon may be. One or two foreign countries are now offering to pay prices only ¼ to ⅜c above U. S. ceiling.

Concession in Copper

Nearly 12 million extra pounds of copper will come from high-cost mines in the next two years, under deals made by Defense Materials Procurement Agency. Champion mine of Copper Range Co., Houghton county Mich., will mine 6.4 million pounds of prime lake copper at 33.8c. Banner Mining Co.'s Miser's Chest deposit near Lordsburg, N. M., will turn out 5.4 million pounds of electrolytic copper at 30.53c a pound.

Deliveries of copper to fabricators skidded 25,000 tons in February to 104,795 tons, Copper Institute members reported. That total includes tonnages delivered from government stocks. Because of fewer working days in the month, refined production dipped to 95,795 tons. Stocks going into March amounted to 59,747 tons.

Controls Chaser: Increased Production

Free use of aluminum is coming closer to reality as parts of the producing industry's giant expansion plans start to bear fruit. Here in background are two aluminum potlines now in operation at Kaiser Aluminum & Chemical Corp.'s huge Chalmette reduction plant near New Orleans. In foreground is part of the natural gas power plant. Capacity is now 100 million pounds annually; when completed the plant will be the largest U. S. primary aluminum producer with capacity of 400 million pounds yearly. Down the coast from Chalmette, near Corpus Christi, Tex., Reynolds Metals Co. is putting the first of two potlines in operation at its San Patricio reduction plant. Second line will be started early in June; eventual production capacity will be 160 million pounds annually

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, **East St. Louis;** high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not lb excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9% base sizes at refinery unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $207-$210 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18% 53.14; phosphor-bronze grade A, 5% 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.62; commercial bronze 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29, commercial bronze, 90% 43.79; red brass, 85% 43.05.

Wire: Yellow brass 38.57, commercial bronze, 95% 41.90; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In.	Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48		30.1	....	....
0.135-0.096	12-48		30.6	....	....
0.095-0.077	12-48		31.2	29.1	33.2
0.076-0.061	12-48		31.8	29.3	33.4
0.060-0.048	12-48		32.1	29.5	33.7
0.047-0.038	12-48		32.5	29.8	34.0
0.037-0.030	12-48		32.9	30.2	34.6
0.029-0.024	12-48		33.4	30.5	35.0
0.023-0.019	12-36		34.0	31.1	35.7
0.018-0.017	12-36		34.7	31.7	36.6
0.016-0.015	12-36		35.5	32.4	37.6
0.014	12-24		36.5	33.3	38.9
0.013-0.012	12-24		37.4	34.0	39.7
0.011	12-24		38.4	35.0	41.2
0.010-0.0095	12-24		39.4	36.1	42.7
0.009-0.0085	12-24		40.6	37.2	44.4
0.008-0.0075	12-24		41.9	38.4	46.1
0.007	12-18		43.3	39.7	48.2
0.006	12-18		44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round— R317-T4, 17S-T4	R-317-T4	Hexagonal— R-317-T4	17S-T4
0.125	52.0	....	....	....
0.156-0.0188	44.0	....	....	....
0.219-0.313	41.5	....	....	....
0.375	40.0	....	46.0	48.0
0.406	40.0	....	....	....
0.438	40.0	....	46.0	48.0
0.469	40.0	....	....	....
0.500	40.0	....	46.0	48.0
0.531	40.0	....	....	....
0.563	40.0	....	....	45.0
0.594	40.0	....	....	....
0.625	40.0	....	43.5	45.0
0.688	40.0	....	....	45.0
0.750-1.000	39.0	....	41.0	42.5
1.063	39.0	....	....	41.0
1.125-1.500	37.5	....	39.5	41.0
1.563	37.0	....	....	....
1.625	36.5	....	....	39.5
1.688-2.000	36.5	....	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, Cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 1-20	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. 1-29	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99% del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked, Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 86.7c; 100 or 350 lb drums only, 100 to 400 lb 71.60c; 700 to 1900 lb 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.3c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Munts metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, "min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

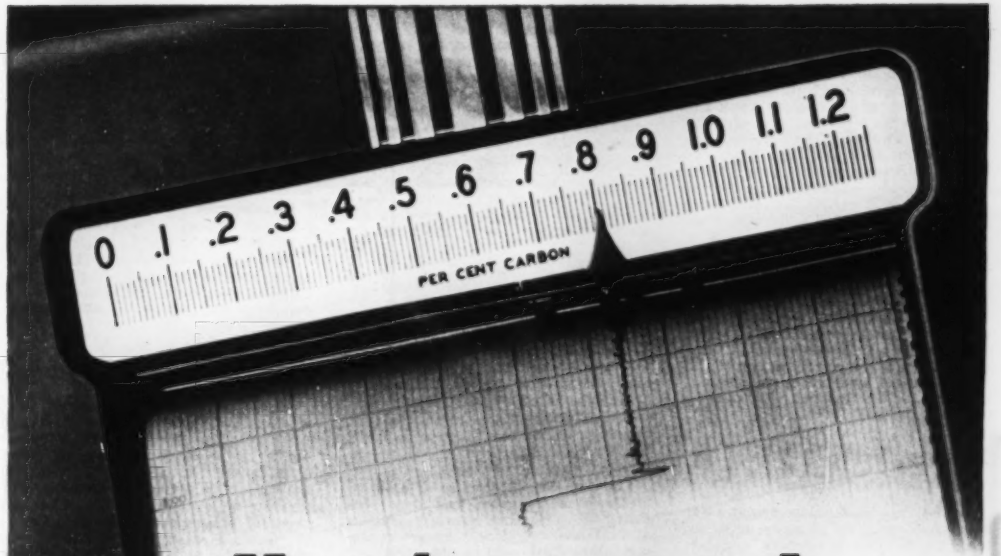
(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more, 7.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.23; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.



Here's a record...

that few have ever seen!

Ninety-nine out of 100 metallurgists and heat-treaters have not yet had a chance to see a continuous instrument record of the carbon in a furnace's carburizing gas. And probably not 99 out of 10,000 production men have seen such a sight.

But neither group is going to be unfamiliar with this advance for much longer, because this valuable information is now as easy to get as a temperature record. It comes from a Micromax Carbon Recorder, which is part of the brand new L&N Microcarb Control.

Already several dozen plants have ordered Microcarb equipment. Here and there a present user is letting his friends drop in for a peek. So, the Carbon Record will soon be pretty generally known to men who look for the modern way to cut carburizing costs or improve carburized parts.

Every metallurgist and heat-treater will probably have his own idea as to exactly what this instrument can mean in his plant. Technically, it shows only the percent of active carbon in the atmosphere of a Homocarb Furnace; but practically, it shows the surface carbon content of the parts being carburized! Used with Microcarb Control, it means that "the carbon you set is the carbon you get." You can control the surface carbon, regardless of whether you want a shallow or deep case; on familiar steels or the newer alloys.

Only Homocarb carburizing equipment of our new Series H can be used with Microcarb, because the furnace and its temperature control must be designed to meet the needs of atmosphere regulation. Specific features are a soundly designed electric furnace with solid-bottom retort, improved fan housing and work support, and aerodynamically designed discharge jets. Micromax temperature control of the Duration-Adjusting Type is included.

The full Microcarb story will be mailed on request. Address either our nearest office, or 4957 Stenton Ave., Philadelphia 44, Pa.

LEEDS NORTHRUP

Jrl. Ad. TD4.623(6)

Semifinished Steel . . .

Semifinished Prices, Page 127

Pittsburgh — Steelmaking operations here moved up 2 points to 104.5 per cent of rated capacity from the previous week's revised rate of 102.5 per cent. The Wheeling rate declined ½ point to 99.5 per cent from the preceding week's revised rate of 100 per cent.

Detroit — Electric furnace operations of Ford Motor Co. established a new record in the week ending Mar. 15 when 4560 tons were produced. Rotary Electric Steel Co. is operating on a 5-day week schedule.

San Francisco—Steelmaking continues at high level, but there is a noticeable easing in demand pressure. While mills are booked through second quarter some selling must be done if third quarter is to show a comparable performance. There is no shortage of CMP tickets.

Sheets, Strip . . .

Sheet and Strip Prices, Page 127 & 128

Boston — Slackening demand for flat-rolled products is more apparent with the smaller producers, converters and premium price sellers. Larger mills are filled for second quarter.

New York—Carbon sheet producers are opening order books for shipment beyond end of second quarter. Some mills will accept tonnage for the entire third quarter. In the case of at least one producer, however, action is being taken for July only. Despite the easier trend in demand, leading producers are convinced there will be no letup in second quarter operations. Premium sellers, however, will be hit.

Philadelphia—Some carbon sheet producers will not open books for third quarter until the beginning of next month. Others are taking action now, one important mill opening for July only. Demand is not too pressing, although the large mills can sustain high output in second quarter. In some consumer durables lines demand pressure is definitely off. Over-all demand, however, is sufficient to engage available output of all except the premium price producers.

Pittsburgh — Automotive demand has stiffened a bit in that slightly more production for second quarter is being sought. Otherwise, market conditions are essentially the same as heretofore. Mills expect to run full speed in second quarter unless conditions change noticeably. On all products, except electrical sheets, producers' books are filled for the period. For third quarter, however, it may be nip and tuck on some products. Order books haven't been opened yet for third quarter and probably won't be until Apr. 2. There's still no major shift in the general situation here.

Cleveland—Increased zinc supply for second quarter will enable producers of galvanized sheets to increase output materially. Demand, however, is so heavy there is little chance much more tonnage will be available for the open market than at present. Larger sheetmakers are booked full for second quarter on practically all grades, specialties excepted. The smaller and premium priced sellers still need tonnage for the period. Looking beyond midyear most producers anticipate progressively easier supply conditions unless demands from consumer durable goods makers pick up noticeably. In event of a steel strike the present trend toward ample supplies will be temporarily reversed.

Detroit—McLouth Steel Corp. last week opened a sales office in Chicago at 310 S. Michigan Ave. Stainless and carbon sheet and strip will be available.

Chicago—Prospects are for a 10 per cent increase in galvanized sheet production in second quarter as result of improved zinc supply. Sheets for coating will impose no obstacle because of softening demand for cold-rolled. Although the price of foreign zinc has been dropping, sheetmakers show little interest in acquiring it.

Birmingham—Little change in demand for sheets is evident here. Third quarter books are expected to be filled quickly.

Los Angeles—Softening of requirements of some sheet and strip consumers is affecting over-all demand at mill level. Fabricators are refusing flat-rolled allotments, working from their inventories.

Steel Bars . . .

Bar Prices, Page 127

Philadelphia — Despite occasional shipment deferments, carbon bar demand continues strong with mills turning away orders. If carbon steel is decontrolled in the last half of this year, bars, along with heavy plates and pipe, probably will be the last products freed of restrictions.

Boston—More consumers are better supplied with carbon bars. This is indicated by improved deliveries on finished products fabricated from more grades in smaller sizes. File manufacturers, users of high carbon flats and special shapes, can ship in one month to six weeks. The same holds for wrenches and a growing number of small tools.

New York—There are some spot openings in carbon bar schedules, but they are quickly filled. In general, requirements continue at high level. Leading producers are behind several weeks on some larger sizes. The larger sizes are going into shells and other munitions. Producers are opening books for third quarter. Some doubt there will be quite the demand for that period they experienced for second quarter, but they are not making any firm predictions to this effect.

Pittsburgh—No appreciable easing is noted in demand for bars. Mills expect heavy requirements into third quarter. The automotive industry is seeking rolling time here for the additional second quarter CMP tickets recently authorized by NPA. Many uncashed tickets for the period cannot be placed here due to overloaded order books.

Cleveland — Barmakers anticipate no letup in demand in the months immediately ahead. Should a steel strike be experienced supply conditions will immediately worsen. Forge shops are urgently in need of forging bars and billets and they almost immediately will feel the effects of any curtailment in production by the mills.

Wire . . .

Wire Prices, Page 129

Boston—Larger consumers of wire are reducing inventories and canceling some tonnage for April and May shipment.

Birmingham — Wire jobbers continue to report a scarcity of the more popular items.

San Francisco—Among the items most noticeably slackening in demand is wire rope. Wire, nails, nuts and bolts also are a lot easier.

Tubular Goods . . .

Tubular Goods Prices, Page 131

New York—Some sellers of mechanical tubing have opened their order books for third quarter. Similar action is expected shortly on merchant pipe. In general, demand is strong for all grades of pipe and tubing, the mills expecting to operate at capacity throughout second quarter. In isolated cases, distributors, especially the smaller ones, have cut back, but producers say that for every ton deferred there is more than enough demand to fill the gaps in schedules. Loosening up of restrictions on building is stimulating merchant pipe demand and is causing added pressure for mechanical tubing. Demand for the latter is tied largely to the defense effort, civilian requirements being squeezed. Galvanized standard pipe production has shown some improvement over recent weeks, in part due to somewhat better zinc supply.

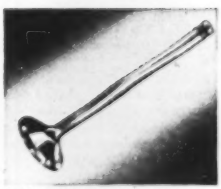
Pittsburgh—Standard pipe supply at mill level is tight, but there are signs in some areas that merchant pipe stocks are approaching normal. Galvanized pipe is scarce. If you go into the market for line pipe for second quarter you still have a hard time getting on mill books. Especially small sizes of black pipe appear to be accumulating in warehouse stocks in certain areas.

Cleveland—Small sizes of merchant pipe at the distributors' level are in better supply, but over-all pipe supply continues as tight as ever. Pipe jobbers are competing more actively for business. This may be reversed now that building restrictions are being lifted. Galvanized pipe is in extremely short supply. With more zinc being made available for second quarter expectations are there will be some easing of the tight situation in this grade.

Detroit—Wolverine Tube Division, Calumet & Hecla Consolidated Copper Co. is planning to install equipment for production of welded and brazed steel tubing.

Chicago—Pipe mills have full order books and see little indication of excess supplies this year. Petroleum and gas pipelines would take larger tonnages if they were available. Standard pipe has been in strong demand. Jobbers have been allowed more galvanized pipe in their quotas because of better availability of zinc. The declining demand for mechanical

for the plant that wants to lead the field with new products



Failing heat in the "heavy duties"

"To improve performance of heavy duty truck and diesel engines, we need a new steel to resist cutting action and warpage of valves caused by hot exhaust gases." **A•E•Service** answered customers' needs with another "first," Carpenter 21-12N Valve Steel to provide new competitive advantages in engine performance.

Giving stainless a new "personality"

Problem as thrown at **A•E•Service** by Carpenter customers: "Give us a *different* stainless we can machine easier, faster, at less cost." Solution: The first Free-Machining Stainless, invented by Carpenter years ago. Once again, Carpenter customers were *first* to benefit.

Yours may be one of the plants that is developing new products for more sales and profits. If so, you'll find you can benefit in many ways from Carpenter's **A**pplication **E**ngineering **S**ervice.

A•E•Service is Carpenter's way of helping you fit the right specialty steel to the job. And in the process, it goes many steps further in helping you come up with a *better* product, and ways to produce that product faster at lower cost.

That's why it's second nature to a Carpenter man to ask about the job requirements when you order steel. He's not being nosey. It's *his job* to make sure you get a steel that produces more than just "desired results." That's **A•E•S**ervice. Quite often, this requires drawing on the added experience of his teammates back in the Mill laboratory. If "tailoring" steels will help, that's **A•E•S**ervice, too.

Many times, when the customer is satisfied with results, we're not. To us, it's a constant challenge to help improve "established" products, make possible new products, and save vital man-hours in the bargain. That is why so many improvements constantly come from Carpenter laboratories to make possible the impossible of yesterday. It's a habit with Carpenter **A•E•S**ervice.

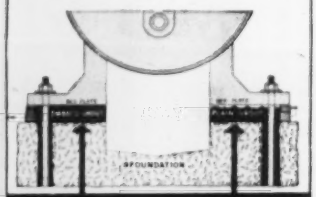
keeps you ahead of competition

THE CARPENTER STEEL COMPANY • READING, PA.

Pioneers in improved Tool, Alloy and Stainless Steels through continuing research

Equipment Need
Regrouting?
Use EMBECO
Non-Shrink Method

Embeco (1) produces flowable, *non-shrink*, ductile grout which . . . (2) gives full, level, *lasting* bedplate contact . . . (3) helps avoid costly shutdowns. (See illustration below.) Write for Embeco booklet . . . gives grouting method based on 35 years' experience.



• • •

Concrete FLOORS
Worn Out?

Resurface With
"Iron-Clad" MASTERPLATE

Masterplate floated into fresh concrete produces iron-armored floor with 4-6 times greater wear-resistance than best plain concrete floor; also spark resistant, static-disseminating and non-slip. Non-colored and 11 colors. For new floors and resurfacing. Write for Masterplate booklet.

For full information on Embeco and Masterplate, write —

The MASTER
BUILDERS Co.
Subsidiary of American Marietta Company
Cleveland 3, Ohio • Toronto, Ontario

tubing seems due for a reversal with relaxing of civilian goods restrictions.

San Francisco — Plumbing pipe is well stocked, reflecting the pinch-back in home building. Residential construction, however, appears again headed upward.

Refractories . . .

Refractories Prices, Page 133

Washington — Domestic production of crude magnesite as well as refractory magnesia and dead-burned dolomite has increased in step with expansion of steelmaking facilities. Accelerated industrial activity stemming from the defense program also stimulated production of other magnesium compounds, such as high grade magnesia and magnesium chloride.

The Bureau of Mines' latest data show production of crude magnesite in 1950 was 429,392 short tons valued at $3,091,135. This compares with 287,315 tons values at $1,950,153 in 1949. Caustic-calcined magnesia, sold or used by producers, totaled 41,447 tons valued at $4,136,898 in 1950 against 32,505 tons valued at $3,109,381 the preceding year.

Refractory magnesia production in 1950 totaled 335,440 tons valued at $14,915,854 compared with 250,389 tons valued at $10,477,856 in 1949. Dead-burned dolomite sold by producers in 1950 amounted to 1,759,443 tons valued at $21,725,560 against 1,318,708 tons valued at $15,930,226 the year preceding.

Structural Shapes . . .

Structural Shape Prices, Page 127

Philadelphia — With easing in governmental restrictions on construction, fabricators view the second half year outlook more optimistically. Smaller shops may benefit before second half actually begins, as their backlogs have not been too heavy and they can take on more work. One large district project contemplated is an Army Ordnance plate plant at Birdsboro, Pa., requiring 5000 to 6000 tons. The plant will be operated by Birdsboro Steel Foundry & Machine Co. producing cast armor plate for tanks. Valley Forge Associates are in on the development of plans. It is reported the project will cost $25 million.

Boston — Direct defense estimates have been cut by cancellation of inquiry for three hangars, 8400 tons. These were to have been built at Limestone, Me., Portsmouth, N. H. and Chicopee Falls, Mass. Bridge inquiry is expanding, fourth superstructure pending for the Fitzgerald Expressway, Boston, closing Apr. 15.

New York — Easing of government limitations on building is reflected in better inquiry, especially for state bridges and institutional structures. More schools and hospitals are being figured and, in this district, a limited amount of office building construction is coming out.

Pittsburgh — District shape producers report all sizes and types of material are tight. Wide-flange structurals are hardest to find. Mills have not had to hunt for orders to keep operating. NPA has been slow in getting tickets issued.

Chicago — Structural fabricators are more concerned over future business volume than current operations. They fear some work now in the planning stage may not materialize.

Birmingham — Considerable projected shape tonnage is reported, especially for new industry. But much of it will not materialize until the overall supply picture clears.

Los Angeles — Industry observers expect 17 construction projects totaling $11,198,740 approved by NPA for Southern California, including the $11 million Hilton hotel, are not enough to quicken slackening demand for structurals.

San Francisco — Structural shapes are more freely offered. Fabricated steel work has slowed down.

Seattle — Fabricators' order backlogs will carry them to midyear. They are seeking work for third and fourth quarters. The structural supply situation is easing slightly but some items continue acutely scarce.

Plates . . .

Plate Prices, Page 127

Washington — The Navy Bureau of Ships awarded contracts for construction of 194 eighty-one ft. sectionalized deck cargo barges to be used by the Army. The contracts, awarded three shipyards, totaled $3,571,000. The following yards were awarded the contracts: Kargard Boat & Engine Co., Marinette, Wis., 100 barges to be delivered to Marietta, Pa.; West Coast Machinery, Inc., Stockton, Calif., 60 barges to be delivered to Seattle; Pidgeon-Thomas Iron Co., Memphis, Tenn., 34 barges to be delivered to New Orleans, La.

Boston — Structural shops are inquiring for more low alloy plates for bridge construction, mostly bearing and traffic plates. Light plates are in ample supply, also heads for small tank building. Heavy plates, 1-in. and over, are tight.

New York — Platemakers are beginning to accept tonnage for third quarter. This is not true in all cases, but all the mills will have to start soon, or 90 days before third quarter begins. Light gage plate is in fairly easy supply for late second quarter. Heavier gages, however, remain tight.

Philadelphia — Heavy plates are scarce, and there is not complete agreement among consumers that light plates are in easy supply. Some buyers are having little difficulty getting all the light plates they require. Others say they can't get all they need. Some mills are opening books for third quarter.

Pittsburgh — Plate supply conditions show little change. Light gage material is easier but heavier and wider plates are scarce. Mill books, filled for second quarter, will be opened for the following three months next week. NPA recently issued some additional second quarter tickets for projects that had been started but stopped when the supply worsened a few months back.

Birmingham — Ingalls Shipbuilding Corp., Pascagoula, Miss., was awarded four landing ships, dock (LSD), totaling $31,576,000. The price does not include central procurement of material, including steel plates estimated to cost $7,975,000 per ship.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 127

Seattle—Approximately 25,000 tons of reinforcing bars are involved in three pending government projects.

Los Angeles — With competition growing fabricators' prices are plummeting. Prices for deformed bars not in place average $7.80 per 100 lb and $9.80 per 100 lb for deformed bars in place.

Pig Iron . . .

Pig Iron Prices, Page 126

Boston—Enough pig iron to tide over the foundries during six weeks' suspension of the Mystic Iron Works furnace at Everett is in sight. This stack goes down for relining late this month. It last was relined in 1948. The furnace has materials on hand to expedite repairs. Iron supply outlook is minimized by under-normal melt and fairly substantial inventories at most shops. For some time past the foundries have been operating on high ratio of iron in their melts. Basic pig iron inventories are low.

New York—Pressure for iron recently increased somewhat with threat of a strike in the steel industry. However, district foundries hold fair inventories, in some cases as much as 30 days supply, the government limit. Morever, operations at gray iron foundries continue to lag.

Buffalo—Despite the threatened steel strike there is no great rush to acquire pig iron. The leading merchant iron seller reports a rather indifferent attitude towards the strike threat by consumers. However, pig iron continues in tight supply. Weather and the threatened strike delayed the blowing in of a new blast furnace at Bethlehem Steel's Lackawanna plant.

Philadelphia—Some district consumers of foundry pig iron, fearing a general steel strike, have asked producers to step up deliveries. Actual consumption, however, is little changed from the slow pace of recent weeks.

Pittsburgh — Easier demand for merchant iron continues. Pickup is expected in the next month and a half due to the spring building season. Inquiries are being received here from other sections of the country. Defense castings are holding up well in this district. All blast furnaces are in production with the exception of Edgar Thomson Works' No. 3 stack, down for relining, and No. 4 at Duquesne Works, blown out Mar. 10 for repairs.

Cleveland—Threat of a steel strike stimulated foundry interest in pig iron to some extent but not sufficiently to result in any renewed pressure on merchant sellers. Most casting shops hold fair inventories. All blast furnaces here with the exception of one are in production. Jones & Laughlin blew out one stack Mar. 15 for extensive repairs.

Birmingham—An easing in demand for pig iron due to slowed foundry operations is evident. However, there is no surplus.

San Francisco—Supply of pig iron

When you need circular rolled and welded steel products in volume, pick up your phone and call the Cleveland Welding Company, Cleveland, Ohio, Woodbine 1-2820. The man you talk to will be a specialist in the mass production of these items, and with specialized equipment plus over 40 years experience, he has the necessary know-how to solve your welded steel, hoop, band and ring problems economically and efficiently. Each year we manufacture millions of steel rings for jet aircraft engines, bogie bands and turret rings for tanks as well as other types of rings, bands and weldments from alloy and carbon steels.

Many leading armament manufacturers have found that because of our mass production and years of experience, we can often quote a lower price than their own internal costs. Phone or mail us details on your volume requirements and let us quote.

THE CLEVELAND WELDING CO.
West 117th St. and Berea Road • Cleveland 7, Ohio
a subsidiary of
AMERICAN MACHINE & FOUNDRY COMPANY

National Metal

LEADING SPECIALISTS IN COLD ROLL FORMING SINCE 1902

Announce

THE AVAILABILITY OF A PORTION OF OUR MODERN FACILITIES FOR D.O. PRODUCTION

Our broad metal forming experience covers shapes that can be fabricated by Cold Rolling steel, bronze, aluminum, stainless steel.

Comprehensive statement of our available capacity at your request. With requests for specific quotations, please include your blue print.

National Metal PRODUCTS CO.
1025 CHATEAU ST.
PITTSBURGH 33, PA.

NATIONAL METAL PRODUCTS COMPANY
Since 1902 Since 1902

Manufacturers of
• Zinc and Bronze Weatherstripping • Stampings • Metal Frame Screens • Special Rolled Mouldings • Bronze and Aluminum Thresholds • Aluminum Awnings • Window Guard Units for Mobile Machine Shop • Zinc Products • Quonset Hut Window Units • Industrial Polishing.

is described here as "not so bad". Easing of cast scrap demand has helped slacken pressure on pig iron.

Iron Ore . . .

Iron Ore Prices, Page 133

Cleveland—Consumption of Lake Superior iron ore in February totaled 7,229,076 gross tons, according to the Lake Superior Iron Ore Association. Of the total, 6,938,791 tons were consumed in U. S. blast furnaces and 290,285 in Canadian stacks. Consumption in the first two months this year totaled 14,756,458 tons against 13,761,549 in the like period of 1951.

As of Mar. 1 there were total stocks at furnaces and lower lake docks of 29,207,005 gross tons. This compares with 35,927,110 tons a month ago, and 24,123,294 tons a year ago. On Mar. 1 U.S. furnaces held 23,467,326 tons and Lake Erie docks, 4,514,021 tons. On Mar. 1 last year U. S. furnace stocks totaled 19,478,799 tons and Lake Erie docks, 3,799,104 tons.

Cleveland—Mine shipments of Lake Superior iron ore to upper lake ports and all rail in 1951 totaled 94,488,009 tons from United States ore ranges and 2,510,934 tons from Canadian districts, making for a grand total of 96,998,943 tons, according to the Lake Superior Iron Ore Association.

Shipments from U.S. ranges were: Mesabi 73,315,255 tons; Vermilion, 1,787,372; Cuyuna, 3,513,827; Fillmore county, 452,235; Gogebic, 5,063,966; Marquette, 5,647,423; Menominee, 4,707,931 tons. Shipments from Canadian districts were: Michipicoten, 1,184,210 tons; Steep Rock, 1,326,724 tons.

Scrap . . .

Scrap Prices, Page 134

Pittsburgh — Collections continue good and mills are gradually building up stocks. Buyers are more selective and upgrading is out. Cast demand is practically nil. Rumors of $2 to $3 per ton price shading are heard on the basis of freight absorption. Prices on open hearth and electric furnace grades continue at ceiling levels. One district consumer is reported holding 700 cars of material on siding.

Cleveland—Some mills will hold up scrap shipments in event of a steel strike, but others plan to accumulate tonnage through the shutdown. This will enable those mills with small inventories to build stocks substantially should the strike be of extended duration. Pressure for the steel grades continues strong, though the mills are exerting more selectivity in acceptances. Quality electric furnace grades are in demand. Cast grades are sluggish and weak.

Detroit—Some mills last week had given instructions for laying scrap down in event of a strike. Demand for good open-hearth material continues steady. Electric furnace material is in easier demand and grades 17 and 18 are going begging. Wanted grades are being bought by mills which specify a delivered price not exceeding a specified maximum. Cast iron is weak. Heavy breakable cast has been sold at $3 under the ceiling to some of the larger consumers. Small foundries, however, are still paying ceiling prices on trucked-in materials.

Boston—One steelworks is holding up shipments of steel scrap, reflecting improved supply and slower demand for finished steel. One open hearth is down and others may follow. Electric furnace grades are slower. Demand for cast is light with prices weak.

New York—Steel scrap demand is sustained, but a strike of any duration will reduce the movement to a virtual standstill. Cast grades are in poor demand. Prices on cupola cast are reported off from ceiling by as much as $2 to $4 a ton.

Buffalo—With a steel strike threatening, quiet steadiness rules in the scrap market. Supply of the cast grades appears to be dwindling. Shipments to mills are maintained at a good clip on allocation orders. Mills' reserve stocks are low.

Philadelphia—Consumers of open-hearth steel scrap have suffered some loss in inventories due to rejections for quality. As a result the mills are pressing hard for more tonnage notwithstanding the threat of a steel strike. Demand for cast scrap lags but a tieup in the steel industry would generate a livelier demand from the foundries for scrap to offset the lack of pig iron.

Washington—Treble damages totaling $143,271 are asked by Office of Price Stabilization in Federal court actions against three Rhode Island scrap dealers. The suits, filed in U.S. District Court at Providence, charges over-ceiling sales. It is claimed the dealers used water transportation charges instead of rail charges in arriving at their ceiling prices.

In still another action at Cleveland, OPS seeks treble damages of $22,847 from a dealer, alleging over-ceiling charges in the sale of scrap aluminum.

Chicago—Steelmaking scrap still is in tight supply but consumers are managing to improve inventories modestly. Mills are inspecting more thoroughly and rejecting below-standard material more frequently. Cast grades continue listless with shading of $2 to $3 per ton and higher for specific items reported.

Birmingham — Scrap supply continues to ease. No new allocations for melting steel are reported. Demand for cast grades shows increasing weakness.

San Francisco — Cast scrap is a drug on the market. Last sale one dealer made to a foundry was $5 under ceiling, but it is not certain what the current going price is. The weakness in cast, however, is not duplicated in steel scrap which continues in demand at ceiling prices.

Seattle—Steel scrap receipts are improving with more favorable weather. Ceiling prices are being paid but the larger buyers find it unnecessary to absorb freight from distant points as they did during the winter crisis. Bundles are plentiful. Cast iron scrap is weak, $28 per ton being the current price with large buyers out of the market.

Warehouse . . .

Warehouse Prices, Page 133

Philadelphia — Warehouses report demand is little stimulated by the steel strike threat. Should a steel tieup of any duration develop, distributors are in more improved position to handle the increased demand load than at any time in recent months as their inventories are in better shape.

Pittsburgh—Operators would still like to see better mill shipments. A few warehouses seem content with their receipts. Recent easing in customer demand has the salesmen out on the road in search of tonnage on flat-rolled and lighter gages of plates. Hot-rolled and cold-finished bars and large flange structurals are tight.

Cleveland — Warehouse operators expect to be flooded with requests for tonnage in event the mills are strikebound. Most distributors, however, cannot accommodate much more business than they are now handling. Their inventories are improved over some time back, but they still are unbalanced and far from normal. March price adjustments were being made last week by warehouse operators in line with OPS regulations.

Chicago—Warehouses are making modest improvements in their stocks of some products. Hot-rolled sheets, hot-rolled bars and cold-finished bars, in the larger sizes, continue tight.

Birmingham — Warehouse stocks are improving, but shipments are almost as large as current receipts.

Seattle—Warehouses report the easing in steel supplies has not extended to this area. Cold-rolled sheets are in better supply but other items continue scarce. Demand is above February's level and will increase as logging, fishing and other industries get into seasonal activity.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 131

Los Angeles—Kaiser Steel Corp.'s Fontana mill will add 90 Koppers-Becker coke ovens to produce coke for a new 1200-ton blast furnace—the plant's third—as part of $65 million facilities expansion underway.

Canada . . .

Toronto—Structural shapes, reinforcing steel, plates and bars continue in tight supply but there are indications of minor easing in other products. Manufacturers of consumer durable goods are having more difficulty selling their products than they are encountering in purchasing raw materials.

Toronto, Ont. — Production of iron and steel shapes in Canada in 1951 totaled a record 4,800,820 net tons. This compares with 4,255,022 in 1950 and 3,666,242 in 1949.

Shipments also were record breaking at 3,121,007 net tons against 2,832,872 in 1950 and 2,708,191 in 1949.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3245 tons, Welfare Island lift bridge, New York, to Harris Structural Steel Co., that city.

1400 tons, mill building, Triangle Conduit &

KRANE KAR WILL DO ANY JOB IN AND AROUND YOUR PLANT

KRANE KAR handles spare blooms for Blooming Mill, large slabs for Rolling Mill, charge boxes in Open Hearth, bars in Cold Drawn Bar Mill (finally loads them into railroad cars), changes rolls and bumper plates in Steel Strip Mill, and stands by to relieve heavy duty overhead cranes; transports all kinds of loads in Machine Shop, Construction and Maintenance Depts. With clamshell bucket, **KRANE KAR** moves sand in Welding and Foundry Depts., and coke in Coke Dept. *Ask for illustrated Bulletin 89—"How Metalworking Plants Reduce Materials Handling Costs."*

Gas or diesel, 12 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires. Buckets, magnets, and other accessories available.

THE ORIGINAL SWING BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

1½, 2½, 5, AND 10 TON CAPACITIES

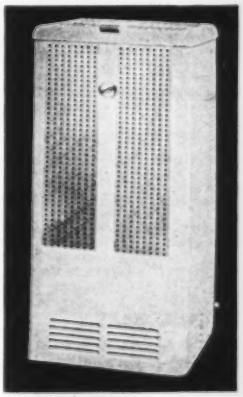
KRANE KAR TRADE MARK REGISTERED

USERS: Carnegie-Illinois, U.S. Steel, Bethlehem, Youngstown S & T, Basic Magnesium, Lima Locomotive, General Motors, Pullman Standard, etc.

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

Hendrick Ornametal

TRADE MARK



Hendrick Ornametal is a decorative, lightweight metal grille suitable for a wide variety of applications, such as for stove panels as shown in the illustration.

Furnished in a wide variety of attractive designs, Ornametal is made of a special bright finish, cold rolled steel, suitable for painting or plating, and is available in a wide range of stock size sheets and gauges.

Write for full information.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Cable Co., New Brunswick, N. J., through Wigton-Abbott, Westfield, N. J., to Bethlehem Contracting Co., Bethlehem, Pa.

1200 tons, plant buildings, National Petro-Chemical Corp., Tuscola, Ill., to St. Joseph Structural Steel Co., St. Joseph, Mo.; J. F. Pritchard & Co., Kansas City, Mo., general contractor.

700 tons, barracks, shops and warehouse, Fort Campbell, Ky., to McCann Structural Steel Co., Nashville, Tenn.; J. W. Bateson Co., Dallas, general contractor.

600 tons, power house, American Viscose Co., Roanoke, Va., to Bethlehem Steel Co., Bethlehem, Pa.

STEEL Tubing

PROMPT DELIVERY FROM STOCK

Mechanical Tubing ⅛" to 14" O.D. • Seamless Pipe to 24" O.D. • Boiler & Pressure Tubes — Seamless or Welded from ⅜" • Stainless Steel Pipe, Tubing & Fittings • Tube Fabrication, Bending, Swaging, Upsetting, etc.

A B MURRAY CO INC

606 Green La.
Elizabeth, N.J.
EL 4-1200

Box 405-H
McKeesport, Pa.
McKPT 4-9107

MATHEWS CONVEYERS

Since 1905, Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-working Industries.

Three modern plants. Engineering Offices in All Principle Cities. There's an Engineering Sales Office near you.

MATHEWS CONVEYER CO.
ELLWOOD CITY - PENNSYLVANIA
SAN CARLOS - - CALIFORNIA
PORT HOPE - ONTARIO, CANADA

CHEMSTEEL CONSTRUCTION COMPANY, INC
203 Chemsteel Bldg. Walnut St. Pittsburgh 32, Pa.

(No "tie-in" with any manufacturer)

Send data on your Design, Engineering & Construction Facilities for erection of

ACID-ALKALI-PROOF TANKS & FLOORING

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE...STATE...

340 tons, railroad bridge, McNary dam relocation project, to American Bridge Co., Portland; J. A. Terteling & Sons, Boise, Idaho, general contractors.

200 tons, overhead traveling crane for Lookout Point dam, to Cyclops Iron Works, San Francisco, low $193,442, to U. S. Engineer, Portland.

150 tons, highway bridge, Bedford, Mass., to West End Iron Works, Cambridge; Monroe-Langstroth, Inc., Norwood, Mass., subcontractor for bridge.

125 tons, boiler supports, Combustion Engineering Superheater Co., Inc., Albany, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

5000 tons, office building, 260 Madison Ave. Corp., Heggeman-Harris, that city, contractor.

5000 to 6000 tons, cast armor plate plant, Birdsboro, Pa., to be operated by Birdsboro Steel Foundry & Machine Co. for the Army. Plans by Valley Forge Associates, Philadelphia.

3100 tons, superstructure, contract C-2c, Fitzgerald Expressway, Boston; bids Apr. 1, Department of Public Work, state, Boston.

2800 tons, two buildings, state hospital, Central Islip, N. Y.; bids Mar. 28.

2500 tons, plant addition, S. Morgan Smith Co., York, Pa.

1930 tons, maintenance hangars, Pinecastle, Fla.; bids to Corps of Engineers, Jacksonville, Fla.

1400 tons, state bridge, Dauphin county, Pa., J. Robert Bazley, Pottsville, Pa., low on general contract.

885 tons, reconstruction, Hamburg-Seneca viaduct, Buffalo; bids Mar. 26.

815 tons, infirmary building, state hospital, Central Islip, N. Y., Lasker-Goldman Co., that city, low on general contract.

650 tons, state bridge, Lehigh county, Pa., bids Apr. 18.

650 tons, state bridge, Essex county, New Jersey, E. W. Kero, Lyndhurst, N. J., low on general contract.

650 tons, state bridge, S. T. 52-8, Madison county, New York; bids closed Mar. 19.

605 tons, state bridge, Bergen county, New Jersey, Sperin Preston & Burrows, low on general contract.

600 tons, state bridge, M.T. 52-3, Madison county, New York; bids closed Mar. 19.

550 tons, elementary school, Lido Beach, N. Y., bids Apr. 1.

545 tons, state bridge, Montgomery county, New York, Wayne Construction Co., low on general contract.

290 tons, Elelson, Alaska, air force base field house, Anderson - Montin - Benson, Seattle joint low bid $1,977,000, to U. S. Engineer, Seattle.

300 tons, two McNary dam structures; bids to U. S. Engineer, Walla Walla, Wash., Mar. 20.

225 tons, incinerator building, Hartford, Conn.; bids Apr. 1.

200 tons, meter shop, Springfield, N. J., for Public Service Electric & Gas Co., Newark, N. J.; bids asked.

150 tons, building, Autograf Brush Co., Watervliet, N. Y.; bids Mar. 24.

135 tons, Bergen county bridge, Hackensack, N. J.; bids asked.

Unstated, 358 trash rack sections, McNary dam; bids to U. S. Engineer, Walla Walla, Wash., April 17.

REINFORCING BARS . . .

REINFORCING BARS PLACED

5000 tons, barracks, shops and warehouse, Fort Campbell, Ky., to Laclede Steel Co., St. Louis; J. W. Bateson Co., Dallas, Tex., general contractor.

1000 tons, plant buildings, National Petro-Chemical Corp., Tuscola, Ill., to Truscon Steel Co., Chicago; J. F. Pritchard & Co., Kansas City, Mo., general contractor.

140 tons, state highway bridge, Billerica-Redford-Burlington, Mass., to Truscon Steel Co., Boston; Peter Salvucci, Waltham, Mass., general contractor.

110 tons, Fort Lewis training school, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

400 tons, Army communications center, Kenai, Alaska; J. H. Pomeroy & Co., Seattle, awarded general contract, low $6,472,000.

PLATES . . .

PLATES PLACED

720 tons, steel piling for Alaska Railroad pier, Nenana, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

PLATES PENDING

100 tons plus, 250,000-gal. water storage tank, Larson air field, Chicago Bridge & Iron Co., Seattle, apparently low, $64,300, to U. S. Engineer, Walla Walla, Wash.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, various sizes, Yakima, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

375 tons, water district No. 42, Seattle, to Pacific States Cast Iron Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

Unstated, King County district No. 75, Seattle; Valley Construction Co., Seattle, low, $51,537.

STEEL PIPE PENDING

Unstated, 6500 feet 10 to 6 inch water pipe; bids in at Wenatchee, Wash., Mar. 17.

RAILS. CARS . . .

LOCOMOTIVES PLACED

Jersey Central Lines, 38 diesel-electric locomotive units, placed as follows: nineteen 1600-horsepower general utility locomotives to American Locomotive-General Electric Companies, Schenectady, N. Y.; thirteen 1600-horsepower general utility locomotives to Electro Motive Div., General Motors Corp., La Grange, Ill.; four 1200-horsepower general utility locomotives to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; and two 1200-horsepower yard switching engines, to the Electro Motive Div., General Motors Corp., La Grange, Ill.

Jersey Central Lines, 38 diesel-electric locomotives; 19 general utility units to American Locomotive Co., New York, 13 to Electro-Motive Division, General Motors Corp., La Grange, Ill., 4 to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; 2 switchers to Electro-Motive Division.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, two diesel rail cars, to Budd Co., Philadelphia.

Fort Dodge, Des Moines & Southern, 200 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Grand Trunk Western, six caboose cars, to International Railway Car Mfg. Co.

Great Northern, 100 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Minneapolis, St. Louis & Sault Ste. Marie, 300 fifty-ton box cars and 100 fifty-ton gondola cars, to its own shops.

Nashville, Chattanooga & St. Louis, 400 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, 600 seventy-ton covered hopper cars and 500 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, seven rail diesel cars, to Budd Co., Philadelphia.

New York, New Haven & Hartford, five diesel rail, to Budd Co., Philadelphia.

St. Louis-San Francisco, 500 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Union Pacific, 2600 freight cars, to its own shops; 500 seventy-ton flat bottom fixed-end gondolas, 500 seventy-ton hoppers, 500 fifty-ton box, 500 fifty-ton auto box, 100 seventy-ton mill type drop end gondolas, and 500 seventy-ton ore cars.

RAILROAD CARS PENDING

Canadian National, 194 passenger train cars of various types, bids asked.

New York, New Haven & Hartford, 100 coaches, 100 baggage cars and 60 electric multiple unit cars, bids asked.

Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

White Pine Copper To Build

Turner Construction Co. has received a contract from White Pine Copper Co. for development of a copper project at White Pine, Ontonagon county, Mich., at an estimated cost of $57 million. Work has begun and completion is scheduled in three years. Included is underground development of the mine and belt tunnels, a mill to process 10,500 tons of ore daily, a smelter, power plant, appurtenance works and a townsite to accommodate about 3000 people.

New Tramrail Agent

Cleveland Tramrail Division of Cleveland Crane & Engineering Co., Wickliffe, O., has appointed Cleveland Tramrail Division, W. A. York Co., Philadelphia, as sales representative for Philadelphia and surrounding territory. Complete erection and service facilities for Cleveland Tramrail overhead materials handling equipment will be available.

Rail Line To Open Mining

Canadian National Railways plans to spend $7.8 million this year on construction of a rail line to open up a new base metal mining area. The 155-mile line will run from Sherridon to Lynn Lake, Man. Over-all cost of the new line will be $14.7 million.

New Procurement Office

North American Aviation Inc., Columbus, O., Division opened a procurement office at 4500 Euclid Ave., Cleveland, for purchasing of outside production tooling, labor, machined parts and vendor contact, inspection and liaison. In production at the Columbus division are AJ-2 Savage bombers for the Navy and F-86 Sabre jet fighters for the Air Force. Production of FJ-2 Fury jet carrier based fighters is scheduled. Additional warehouse facilities for storage of surplus property and master plaster molds for plane spare parts totaling 130,000 sq ft have been leased.

G. E. Jet Accessories

Design, manufacture and sale of turbine-driven accessories for jet engines and aircraft mark an expansion announced by General Electric Co. Designated Accessory Turbine, the new business will be headed by J. P. Turner Jr., says L. T. Callahan, manager of the Aircraft Gas Turbine Division's Lynn operation. Products now being produced or developed by the Accessory Turbine business include turbosuperchargers and impellers, jet engine starters, turbine driven fuel pumps, and air-turbined drives for alternators and hydraulic pumps.

Diamond Alkali To Expand

Diamond Alkali Co. of Painesville, O. awarded contracts to H. K. Ferguson Co., Cleveland, for expansion that will more than double Diamond's productive capacity of chlorine and caustic soda by the electrolytic method. With its increased production, the firm will abandon the traditional lime-soda process of producing caustic. Construction has already started.

Oakman Opens Second Plant

Oakman Mfg. Co., Detroit, opened a second plant, says Gordon O. Rice, general sales manager. The new structure will more than double the capacity of this producer of medium and heavy stampings.

Willard Storage's Fiftieth

Willard Storage Battery Co., Cleveland, celebrated its fiftieth anniversary this month. Founded by T. A. Willard in 1902, the firm today has plants in Cleveland, Memphis, Toronto, Portland, Dallas, Los Angeles and Allentown, Pa. with subsidiary plants in Minneapolis, Omaha, Denver, and Warsaw, Ill. under the name of the Grant Storage Battery Co.

Joy Mfg. Buys Craig Bit

Joy Mfg. Co. purchased control of the Craig Bit Co. Ltd., North Bay, Ont., manufacturer of rock drill bits. The firm was acquired as part of Joy's policy of manufacturing parts and accessories for its own products wherever advisable.

Anderson Appoints Agent

John Hewson Co., New York, was appointed general sales agent for the Industrial Staticator—automatic static detecting and warning equipment manufactured by W. E. Anderson Inc. of Kansas City.

Allied Enlarges Plant

Contracts were let for construction of an addition to one of Allied Products Corp.'s plants in Hillsdale, Mich. This plant is devoted exclusively to production of hardened and precision

Malleable iron wedges, before (top) and after (at left) the toughness test.

"THIS MOVING WORLD"

Full technicolor film shows how

MALLEABLE IRON is made—tested—used

Arrange a Free Showing for your technical society —service club—engineering class— trade school—or plant personnel.

This 30-minute technicolor film narrated by Edwin C. Hill was produced to provide interesting metallurgical, engineering and application information on the valuable properties of Malleable Iron.

It shows Malleable Iron being made—tested—and used, for economy in the manufacture of many different products.

Instructors in technical schools and colleges will find it invaluable as source material for classes in metallurgy and engineering. Technical societies and manufacturing groups will find it extremely helpful in their study of materials and production. Service clubs and other non-professional groups will find it interesting as depicting modern methods in manufacture of many products in daily use by members. It is furnished to responsible groups without cost. Use the coupon below to request its use.

MALLEABLE FOUNDERS' SOCIETY

Union Commerce Bldg., Cleveland, Ohio

SEE MALLEABLE IRON BEING MADE—TESTED—USED

MALLEABLE FOUNDERS' SOCIETY
Union Commerce Bldg., Cleveland, Ohio

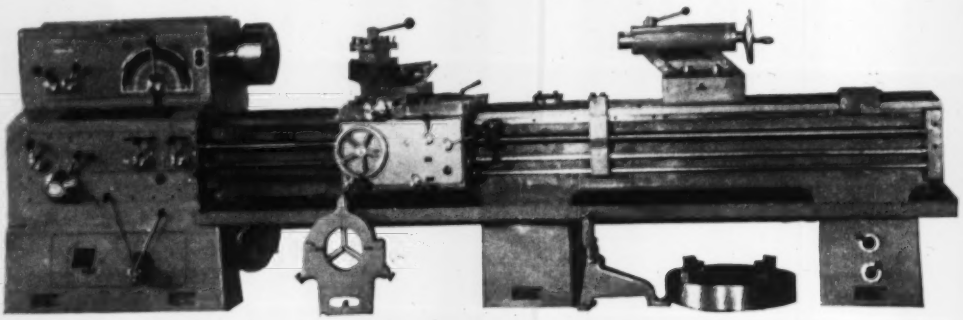
☐ Please send print of the 16 mm technicolor sound film on Malleable Iron entitled "This Moving World".

Date wanted .....

Name ..... *Title* .....

Firm or School .....

Address .....



NEW LARGE HEAVY DUTY MEUSER LATHES IN STOCK FOR IMMEDIATE SHIPMENT, NO PRIORITIES NEEDED

at tremendous savings in price.

24", 28" and 32" SWING, ALL GAP BED TYPE, UP TO 240" CENTERS

(Smaller Sizes Also Available from Stock)

Illustrated above: 24" x 100" Centers New Meuser Lathe, Gap Bed Type, 34" Swing in Gap, 27 Spindle Speeds, (7.8—900 RPM). Complete with the following equipment: Three and Four Jaw Chucks, Follow Rest, Steady Rest, Four way Tool Post, Centers, Standard Tool Post, Threading Dial. Carriage Stops, Taper Attachment.

HERBERT MACHINE TOOL CO., INC.
326 W. Ohio St., Indianapolis 2, Ind., PLaza 2409

HIGH SILICON IRON.
"JISCO"

SILVERY PIG IRON

A Blast Furnace Product made from only Virgin Ores

THE JACKSON IRON & STEEL CO. • JACKSON, OHIO

The *Cleveland Steel Tool Co.*

• PUNCHES • DIES • CHISELS • RIVET SETS •

IF IT'S *RIVETED* YOU KNOW IT'S SAFE

WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

THE BELMONT IRON WORKS

STRUCTURAL STEEL—BUILDINGS & BRIDGES

RIVETED—ARC WELDED *Cable Address—Beliron*

Engineers—Fabricators—Erectors—Contractors—Exporters

Shops—Philadelphia—Eddystone—Royersford

Main Office: Phila. 46, Pa.

New York Office—44 Whitehall St., N. Y. 4, N. Y.

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

ground machine parts. The expansion will provide for increased production of about 50 per cent. The addition is expected to be opened about Aug. 1.

Kelly Reamer Names Agent

Kelly Reamer Co., Cleveland, appointed Tool Supply Co., that city, as exclusive sales and engineering representative for northern Ohio.

New Hubbell Warehouse

Opening of a new, 54,000 square foot warehouse in St. Louis was announced by H. H. Hubbell, president of Hubbell Metals Inc. The $400,000 structure augments facilities in Kansas City and Indianapolis, distributing aluminum, brass, copper, stainless steel and steel, as well as a variety of fittings and accessories.

Westinghouse Opens Branch

Westinghouse Electric Corp. announces creation of a branch sales office in Pittsburgh to be headed by J. E. Renz as branch manager. The new branch will be comparable to Cincinnati, Cleveland and Detroit offices presently operating, says J. E. Payne, vice president and central district manager.

U. S. Air Merges Office

Consolidation of its New York sales forces into a single agency is announced by United States Air Conditioning Corp. The office will handle a complete line of air conditioning, heating and ventilating equipment in the New York City and New Jersey area.

Schneible Opens New Offices

Claude B. Schneible Co., manufacturer of dust control systems for foundries, metalworking and process industries, opened new executive and sales offices at 212 Stephenson Bldg., W. Grand boulevard and Cass, Detroit. The advertising and accounting departments also operate from the new quarters. Factory offices, such as engineering production and purchasing, continue to function from the Schneible plant, 2827 25th St., Detroit.

Industrial Freezer Agent

Industrial Freezer Division of Webber Appliance Co. Inc., Indianapolis, named English & Miller Machine Co., Detroit distributor in Detroit and eastern Michigan, for Webber industrial freezers. The units are applied in production line work on shrink and fit methods, stabilization of metal, metal hardening, storage and testing of materials at extremely low temperatures.

Ryan's 'Hi Boy'

This vertical turret lathe at the Ryan Aeronautical Co., San Diego, Calif., has the highest boring mill with raised bed ever installed on the Pacific Coast. Dubbed "Hi-Boy," the 64-inch Bullard Cut Master can turn metal sections measuring from ½ inch to just under 7 feet

American Radiator Revamps

Modernization and improvement costing $2 million now under way at American Radiator & Standard Sanitary Corp.'s stamping plant in Buffalo is scheduled for completion late this year. The firm is now negotiating with the government for an order which would double the employment to about 1200, says Gilmore Roberts, plant manager.

Kraft Forms Kaynide Division

Chemicals, anodes, processing equipment and plating supplies formerly handled by Kraft Chemical Co. will be stored and sold by the newly formed Kaynide Division says Gerald G. Kraft of Kraft Chemical Co., Chicago. Many new items to be handled by the Kaynide Division include white brass anodes and the Kaynide bright copper process for bright copper plating.

Tonawanda Electric To Move

Tonawanda Electric Steel Casting Corp., North Tonawanda, N. Y., is completing a $1 million plant and will soon move from its present leased plant to the new location. About $25,000 worth of equipment will be installed in the new structure for production of carbon steel castings.

Goodyear Expansion Planned

Plans for expansion of Goodyear Tire & Rubber Co.'s tire fabric production was announced as Wigton-Abbott Corp. of Plainfield, N. J. received a contract for the design and construction of a large, air-conditioned,

COWLES

GANG SLITTING KNIVES

OVER 30 YEARS EXPERIENCE

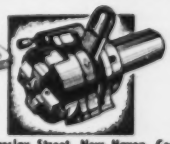
Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*

COWLES TOOL COMPANY

2086 W. 110th ST. CLEVELAND 2, OHIO

H&G Insert Chaser DIE HEADS

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.



THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 114 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada*

PERFORATED METALS
FOR ALL INDUSTRIAL USES
PERFORATIONS IN LIGHT SHEETS
TO HEAVY PLATES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

INTRODUCTION TO THE STUDY OF
HEAT TREATMENT OF METALLURGICAL PRODUCTS
By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages 4 tables
69 illustrations Price $5.00 Postpaid

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

It's your SCRAP for more Steel!

CASE STUDY NO. 1:

88 Carloads

Here's a photographic equipment manufacturer with a systematic metal-salvage program. No more scrap, they said. Yet, after more careful study, they found 88 carloads of heavy iron and steel scrap in a 30-day period!

CASE STUDY NO. 2

Metalworking Plant Surprised!

This big fabricator reported all scrap being turned in. When told needed scrap includes old equipment, not just "production" scrap, they uncovered extra tons of iron and steel.

CASE STUDY NO. 3:

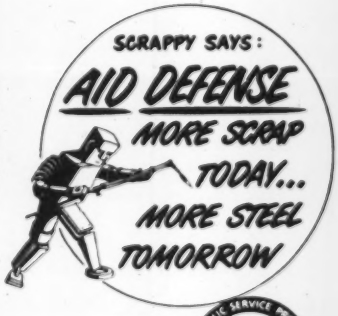
Paper Converter Delivers!

This plant replaced 3000 obsolete machines with new ones. Held old ones for occasional spare parts. Changed mind, scrapped 2800, reduced inventory.

You, too, may have iron and steel scrap you don't know about. Almost *any* plant has.

That scrap is badly needed to aid defense. Steel mills may have to let furnaces grow cold unless they get more scrap to meet the needs of greatly expanded capacity.

Remember—we need 3000 carloads of scrap a day for steel mills and foundries—much more than we are getting now. Every pound counts. Start *your* scrap salvage program *today* by writing for your copy of "Top Management: Your Program For Emergency Scrap Recovery", to Advertising Council, 25 W. 45 St., New York 19, N. Y.



A PUBLIC SERVICE PROJECT THE ADVERTISING COUNCIL

NON-FERROUS SCRAP IS NEEDED, TOO!

This advertisement is a contribution, in the national interest, by

STEEL

The Weekly Magazine of Metalworking

windowless manufacturing building at the Goodyear plant in Cartersville, Ga. Construction of the 299 x 280 foot structure will start at once.

New Porcelain Group

Formation of a New Uses Committee headed by C. P. Lohman was announced by Porcelain Enamel Institute. Consulting, technical or developmental assistance may be obtained by any metal product producer testing porcelain enamel as his product finish without charge by writing the Porcelain Enamel Institute, 1010 Vermont Ave. N. W., Washington 5.

Cleaver-Brooks Names Agent

Cleaver-Brooks Co., Milwaukee, announces Wilson-Weesner - Wilkinson Co., Nashville, Tenn. will handle Cleaver-Brooks heat generation and utilization equipment in portions of the Kentucky-Tennessee area. The firm was serving as a distributor for Cleaver-Brooks Road Machinery Division equipment.

Clover Buys Plant

Clover Industries Inc., Buffalo, which stamps aluminum parts for the aircraft industry, purchased a plant in Tonawanda, N. Y., and will move from its Buffalo location.

Motorola Forms New Division

Motorola Inc., Chicago, established its National Defense Division headquarters in its Claybourn avenue plant, that city. J. Benton Minnick is manager of this division. The company expects about 25 per cent of its total volume will be in defense work this year.

Morrison Steel Expanding

Morrison Steel Products Inc., Buffalo, says its $1.7 million expansion will be completed by June. The firm reported a military order backlog of $2 million; about one fourth of its current production is defense work. The new addition will provide 120,000 square feet.

Super-Cold Completes Plant

Super-Cold Corp., Los Angeles, manufacturer of refrigeration equipment, Navy rockets, and airplane wings, completed plant No. 7 at 840 E. 111th Pl., that city.

Ferry Steel's Fiftieth

Ferry Steel Products & Equipment Co., San Francisco, is celebrating its fiftieth year in the manufacture of spiral chutes, bins, hoppers, tanks and other structural and sheet steel products.

Clark Bros. May Buy Plant

Clark Bros. Co. Inc., Olean, N. Y., is negotiating for purchase of Pennsylvania Railroad's engine house and heavy repair shop in that city. If the deal is completed, Clark Bros. would have an additional 110,000 square feet of plant space on a site covering 45 acres. An official of the firm said it has not been decided to what use the new plant would be put. The facilities would require extensive remodeling.

Vendorlator Plant Coming

Construction of the new Vendorlator Mfg. Co. plant building in Fresno, Calif. is expected to be completed within 60 days. Machine tools will be utilized in the new plant to meet expanding defense subcontracts with Douglas Aircraft Co., says H. S. Childers, president.

Peterson Moves Warehouse

Peterson Steels Inc. moved from Newark, N. J., to new headquarters and warehouse in Union, N. J. It is the only warehouse in the country devoted exclusively to AISI 52100 steel products.

Eversharp Buys Climax Pump

Eversharp Inc. bought Climax Engine & Pump Mfg. Co. of Clinton, Iowa says Carl G. Preis, Eversharp president. Climax is to be operated as an independent division of Eversharp Inc. under Eversharp's policy of diversification with no change in its present personnel.

A. C. Woods & Co. Renamed

Kropp Forge Co. says the name of its wholly-owned subsidiary, A. C. Woods & Co., Rockford, Ill., has been changed to Kropp Steel Co. The subsidiary is engaged in the steel fabricating and weldment business and was acquired by Kropp Forge Co. in October, 1949.

Wellman Opens New Offices

Wellman Bronze & Aluminum Co., Cleveland, opened offices for its executive, sales, accounting and purchasing departments at 12800 Shaker Blvd. Production management department will remain at the Peerless plant, 2525 E. 93rd St.

A. E. Bausenbach Expands

A. E. Bausenbach Inc., Buffalo, producer of metal containers for military equipment, is expanding its production facilities by leasing the plant of the R. G. Wright Co. Inc. at 35 Roetzer St., that city.

"SEE WHAT
WHITEHEAD
CAN DO ON THESE
STAMPINGS"

All types and sizes. Assembling, finishing, diemaking. Detroit plant with operations developed over half-a-century. Nationally known for accuracy, value, dependability. Send your blueprints for an estimate.

WHITEHEAD STAMPING CO.
EST. 1903
1667 W. Lafayette • Detroit 16, Mich.

OHIO LOCOMOTIVE CRANES
25 TO 50 TON CAPACITY
DIESEL • GASOLINE • ELECTRIC • STEAM
THE OHIO LOCOMOTIVE CRANE CO
BUCYRUS OHIO

FOR OVER 50 YEARS
MOLINE "Hole-Hog"
SPECIALLY DESIGNED
MACHINE TOOLS
HAVE CUT PRODUCTION COSTS
FOR AMERICAN INDUSTRY
MOLINE TOOL CO.
DRILLING
BORING
HONING
TAPPING and
Special Machines

THEORY AND PRACTICE OF ROLLING STEEL . . By Wilhelm Tafel
312 Pages
Price Postpaid $4.50
Covers every angle of the design, construction and operation of the steel rolling mill.
THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

Versatility counts in
HOT DIP GALVANIZING
any size or shape product, any size
order from the smallest to the largest
Excellent facilities for pickling and oiling
ENTERPRISE
GALVANIZING COMPANY
2525 E. Cumberland Street Philadelphia 25, Pa.

MATERIALS--USED EQUIPMENT

RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton
Cabooses, Eight Wheel, Cupola Type
Flats, 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite or All Steel, 50-Ton and 70-Ton
Gondolas, All-Steel, 55-Ton, Solid Bottom
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 8,000-Gallon, Class II
Tank, 3,000-Gallon, High Pressure

EXTRA LONG FLAT CARS

40 & 50-Ton Capadty, Length 70' and 74'

STANDARD GAUGE DUMP CARS

End Dump, 20-Yd., 50-Ton Drop Door **End** Dump, 10-yd., 30-Ton Lift Door
Side Dump, 16-Yd., 30-Ton Lift Door

STANDARD GAUGE DIESEL LOCOMOTIVES

One Plymouth Diesel-Mechanical, 65-Ton, Type 0-6-0, Built 1940
One Davenport-Besler Diesel-Electric, 110-Ton Type 0-4-4-0, Built 1938
One 1500 H.P., 120-Ton, Road Switcher, Diesel-Electric, Type 0-4-4-0

Send us your inquiries **We Buy Freight Cars for Dismantling** ***Send us your offerings***

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

IMMEDIATE DELIVERY

ROLLER LEVELLERS

MCKAY ½" TO 2" FOUR-HIGH LEVELLER 15" Diameter Rolls, (9) Leveling rolls, (11) backing up rolls, (2) Pinching rolls, (1) 300 HP motor for main drive, (2) 10 HP motors for screw down and (1) 2 HP motor for pinch roll adjustment.

MCKAY ¼" TO 2" TWO-HIGH LEVELLER 13" Diameter Rolls, (11) Leveling rolls, (2) Pinching rolls, with 150 HP motor for main drive, (2) 7½ HP motors for screw down.

ABOVE MACHINES ARE NEW IN 1943, SELLING FOR 1/5 OF NEW COST, USED ONLY 6 MONTHS.

PUNCH PRESSES

1400 TON COMBINED CAPACITY, BLISS #2ET-10 TRIPLE ACTION TOGGLE 650 Ton, 39" stroke, 75" shut height of plunger, 400 Ton, 28" stroke, 72" shut height of blankholder, 350 Ton, 12" stroke of lower ram, 62" x 86" bed area.

525 TON, BLISS #410A DOUBLE ACTION TOGGLE 25" stroke, 62" shut height of plunger, 17" stroke, 60" shut height of blankholder, 60 x 84" bed area.

255 TON, TOLEDO #96-D DOUBLE CRANK, STRAIGHT SIDE 6" stroke, 30" shut height, 51 x 87" bed area.

150 TON, CLEVELAND #60-D-84 DOUBLE CRANK 12" stroke, 29" shut height, 46½" x 86" bed area.

500 TON, BLISS #48 STRAIGHT SIDE FORGING 10" stroke, 38" shut height, 30 x 19" bed area.

200 TON, VERSON #40ES ALL STEEL, LATE TYPE 30" stroke, 23" shut height, 35½" x 37¾" bed area.

MANY OTHER PRESSES IN STOCK FROM 5 TO 1400 TON CAPACITY.

PAUL'S MACHINERY COMPANY

6111 VERMONT, DETROIT 8, MICHIGAN
TYler 76300

MATERIALS--USED EQUIPMENT

Wanted to Purchase:

A LARGE

SCRAP YARD

which is now in operation

Please list the following in your reply:

Average yearly tonnage processed (last 5 years)

Inventory on hand (processed and unprocessed)

Type, capacity and present condition of processing and handling machinery.

Average number of employees

Railroad and Wharfage facilities

Price desired

WRITE TO:

Principals c/o Box 468, Steel
Penton Bldg., Cleveland 13, Ohio

FOR SALE

WIRE DRAWING FRAME

Fourteen 16" blocks, air cooled die holders, complete with Ideal 100 H. P. 900 R. P. M. synchronous motor, 80% P. F., 230-60-3, with direct connected exciter, spare blocks, controls, silent chain drive, strippers, parts, etc.

Write Box 466, STEEL,
Penton Bldg., Cleveland 13, Ohio

FOR SALE

20,000 #	.029 36 x 144"	C.R. Soft Primes
21,000 #	.035 36 x 130"	C.R. Soft Primes
3,650 #	.035 41 x 97½"	C.R. Soft Primes
5,075 #	.038 43 x 84"	C.R. Soft Primes
4,500 #	.038 28/36" x 90/130"	C.R. Soft Primes
4,500 #	.039 28/36" x 96/130"	C.R. Soft Primes
5,000 #	.039 31/36" x 70/130"	C.R. Soft Primes
20,000 #	14 Ga. 35/36" x 8/10' H.R. P&O	
5,000 #	.011 x 25 x 36" TIN MILL BL. PLATE PRIMES	
14,000 #	0.13 x 19 x 36" ELECTROLYTIC TIN PLATE PRIMES	

(We SHEAR or SLIT to your Sizes)
SEABOARD STEEL CO., INC.
NEW HAVEN, CONN.

National Grating Welder

FOR SALE

Large Resistance Welding Machine to make wire mesh from any gauge wire in spacings of 3" and up and widths up to 10 feet. Also equipped for conversion into a press welder with a capacity of approximately 60 welds between 2 pieces of 16 ga. mild steel. For additional information and price, write

AIRTHERM MANUFACTURING CO.
700 S. Spring Ave. St. Louis 10, Mo.

FOR SALE

1—four Woon Tables for Hot Sheet Mill
1—130" x ¼" Sheet Squaring Shear.

FRANK B. FOSTER, INC.
2220 Oliver Building Pittsburgh 22, Pa.
Cable Address "Foster Pittsburgh"

NEW and REBUILT
MOTORS
GENERATORS
TRANSFORMERS
1 to 1500 H. P.
ELECTRIC EQUIPMENT CO.
ROCHESTER 1, NEW YORK

FORGING & DIE SINKING EQUIPMENT

All Kinds We Buy—We Sell Contact Us First

WILKIE DIE PRODUCTS COMPANY

Specialists in Forging Equipment
1186 Hawthorne Blvd. Grosse Pointe Woods 30, Mich.
Phone (Detroit) TUxedo 1-7140

BORING MILLS, 24"-36"-42"-52"-66"-72"
BULLDOZERS, No. 25 and 27, W. and W.
HAMMER, NAZEL, 5-N, 6" x 6", M.D.
KEYSEATERS, Nos. 1, 2 and 5, BAKER.
LATHE, 42" x 30' PUTNAM, M.D.
SHAPER, 36" MORTON Draw Cut, M.D.
STRAIGHTENER, Shape No. 3 SUTTON.

WEST PENN MACHINERY COMPANY
1210 House Bldg. Pittsburgh 22, Pa.

• CLASSIFIED •

Help Wanted

METAL WORKING

SALESMEN WANTED

Commission salesmen wanted by high grade, long established manufacturer of Industrial Oils, Greases and Chemicals. Must have metal working following. Full selling cooperation given on advertised line. Lucrative line of products that will easily work in with other products handled. Representation wanted in Pittsburgh, Harrisburg, Baltimore, Boston, Hartford, Troy, Syracuse, Buffalo, Newark. Give background and other details in letter.

Address Box 469, STEEL,
Penton Building Cleveland 13, Ohio

STEEL WAREHOUSE MANAGER

Progressive established company wants experienced steel warehouse man to take complete charge of sales and operations of steel warehouse servicing Eastern area with steel mill products. Must be thoroughly experienced with proven record of accomplishment. Salary commensurate with qualifications and ability. All replies strictly confidential. Our personnel know of this advertisement. Three Resumes Required. Write or phone Hoxie W. Smith, EXECUTIVE SERVICE CORP., agency, 19 West 44th St., New York, N. Y. MU. 2-4000.

STRUCTURAL AND MISCELLANEOUS STEEL shop foreman wanted for expanding plant with 200 ton monthly capacity. Should have 10 years' experience, know economical production, be sober, honest and dependable. Location Stockton, California, a fine small city. Good salary for good man. Give complete information about experience, earnings, references, when available. Box 473, STEEL, Penton Bldg., Cleveland 13, O.

WANTED: BOSS ROLLER OR SUPERVISOR with Roller experience. Thoroughly familiar with bar mill work. Western Pennsylvania Tool Steel Mill. Salary open. Write Box 470, STEEL, Penton Bldg., Cleveland 13, Ohio.

MANAGER — INDUSTRIAL STEEL WAREHOUSE located in South seeking experienced manager. Salary commensurate with experience and ability. Write Box 465, STEEL, Penton Bldg., Cleveland 13, O.

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

Opportunities

PLATE FABRICATOR
DESIRES ADDITIONAL PRODUCTS

Will purchase outright or manufacture and sell same on royalty basis.
Write Box 459,
STEEL, Penton Bldg., Cleveland 13, O.

CARBONIZATION—METHOD PATENT:

CONTINUOUS CONTROLLED OPERATION FOR FINEST COKE PRODUCTION UTILIZING ANY GRADE OF COALS REGARDLESS OF VOLATILES. MOST ECONOMICAL OVENS FROM EVERY STANDPOINT.

BOX 471, STEEL
Penton Building, Cleveland 13, Ohio

Contract Work

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ¾" Pl.
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

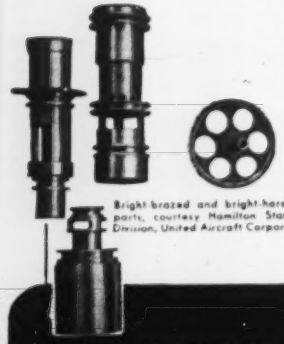
Employment Service

SALARIED POSITIONS $3,500 TO $35,000, WE offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

Positions Wanted

MANUFACTURING OR SALES

Diversified experience as Chief Metallurgist of tractor works Production Superintendent, Sales Engineer and Works Manager of foundry producing heat resistant and stainless castings. Desires position with progressive organization. Write Box 472, STEEL, Penton Bldg., Cleveland 13, Ohio.



Bright-brazed and bright-hardened parts, courtesy Hamilton Standard Division, United Aircraft Corporation.

★ BRIGHT BRAZING

OF STAINLESS STEEL AND NON-FERROUS METALS WITH A

SARGEANT & WILBUR CONVEYOR FURNACE

Now, parts made of stainless can be BRIGHT-ANNEALED, BRIGHT-HARDENED or BRIGHT-BRAZED without oxidation, on a continuous production basis. They come from the controlled-atmosphere conveyor furnace scale-free, bright and clean.

No pickling, sand blasting or tumbling required. These costly operations are eliminated, so your parts retain their sharp design and edges. A special Sargeant & Wilbur alloy for bright-brazing makes the joint practically invisible because it resists dulling and matches the metal color perfectly. Steel and non-ferrous metal parts are brazed in the same operation with excellent results.

Your samples processed FREE. To see your products bright-brazed, send samples and specifications.

SARGEANT & WILBUR, INC.

180 WEEDEN STREET, PAWTUCKET, R. I.

Send for free illustrated booklet giving more information on the Sargeant & Wilbur Conveyor Furnace.

Name .....

Company .....

Address .....

REPRESENTATIVES

NEW YORK CITY and PENNSYLVANIA Gerald B. Duff, 68 Clinton Ave., Newark, N. J.; MICHIGAN and NORTHERN OHIO M. C. Schwar, 2970 W. Grand Blvd., Detroit 2, Mich.; NEW ENGLAND James J. Herkis, 184 Weeden St., Pawtucket, R. I.

Advertisers in this Issue

Alan Wood Steel Co. 123
Alliance Machine Co., The 106
Allis-Chalmers 26, 27
Aluminum Company of America 14, 15
American Brass Co., The 95
Armco Steel Corporation 34
Atlas Screw & Specialty Corp. 104

Barium Steel Corporation 2
Belmont Iron Works, The 148
Bethlehem Steel Co. 1
Bixby, H. W., Inc. 153
Bliss, E. W., Co. 82, 83
Browning, Victor R., & Co., Inc. 148
Bullard Co., The 52
Byron Jackson Co. 117

Carpenter Steel Co., The 141
Century Electric Co. 85
Chambersburg Engineering Co. 136
Chemsteel Construction Co., Inc. 146
Clark Bros. Co., Inc. 88
Cleveland Steel Tool Co., The 148
Cleveland Welding Co., The 143
Cleveland Worm & Gear Co., The Inside Back Cover
Continental Foundry & Machine Co. 87
Copperweld Steel Co. 55
Cowles Tool Co. 149
Crucible Steel Company of America 80
Cutler-Hammer, Inc. Back Cover

Dayton Rubber Co. 22, 23
Delco Products, Division of General Motors Corporation 48
Denison Engineering Co., The 7
Diamond Mfg. Co. 149

Eastern Machine Screw Corp., The 149
Eaton Manufacturing Co., Reliance Division 66
Electric Controller & Mfg. Co., The Inside Front Cover
Electric Equipment Co. 153
Elgin National Watch Co., Abrasives Division 5
Enterprise Galvanizing Co. 151

Federal Products Corporation 96
Firestone Steel Products Co. 37
Follansbee Steel Corporation 102
Foster, Frank B., Inc. 153
Frasse, Peter A., & Co., Inc. 132

General Electric Co. 112
Goodyear Tire & Rubber Co., Inc., The 4
Gordon, Claud S., Co. 114
Gorham Tool Co. 12
Gulf Oil Corporation 119
Gulf Refining Co. 119

Harris Foundry & Machine Co. 77
Hendrick Manufacturing Co. 145
Herbert Machine Tool Co., Inc. 148

International Business Machines 13
Iron & Steel Products, Inc. 152

Jacksen Iron & Steel Co., The 148
Johns-Manville 130
Jones & Laughlin Steel Corporation 109

Kenilworth Steel Co., The 59
Kidde, Walter, & Co., Inc. 10
King Fifth Wheel Co. 97

Laclede-Christy Co. 75
Landis Machine Co. 8

Lebanon Steel Foundry 114
Leeds & Northrup Co. 139
Lewis Welding & Engineering Corporation, The 124
Link-Belt Co. 21
Lurie Brothers & Co., Inc. 135

McKay Machine Co., The 47
McKee, Arthur G., & Co. 91

Macwhyte Co. 3
Malleable Founders' Society 147
Marsam Corporation 104
Master Builders Co., The 142
Mathews Conveyor Co. 146
Modern Engraving & Machine Co. 115
Moline Tool Co. 151
Monarch Machine Tool Co., The 25
Monarch Rubber Co., The 92
Murray, A. B., Co., Inc. 146

National Metal Products Co. 144
National Steel Corporation 24

Oakite Products, Inc. 120
Ohio Locomotive Crane Co., The 151
Osborn Manufacturing Co., The 65

Pawtucket Manufacturing Co. 6
Pittsburgh Steel Co. 111
Pollock, William B., Co., The 105

Ready-Power Co., The 108
Reliance Division, Eaton Manufacturing Co. 66
Republic Steel Corporation 79
Roebling's, John A., Sons Co. 9
Ryerson, Joseph T., & Son, Inc. 38

St. Joseph Structural Steel Co. 153
Sargeant & Wilbur, Inc. 154
Scovill Manufacturing Co. 28
Seaboard Steel Co., Inc. 153
Silent Hoist & Crane Co. 145
Simonds Abrasive Co. 118
Standard Pressed Steel Co. 98
Superior Air Products Co. 110

Texas Co., The 30
Timken Roller Bearing Co., The, Steel & Tube Division 56
Tinnerman Products, Inc. 60
Transue & Williams Steel Forging Corporation 63

Union Wire Rope Corporation 99
United Engineering & Foundry Co. 29

Warner & Swasey 16
Washburn Wire Co. 20
Waterbury Farrel Foundry & Machine Co. 11
Wean Equipment Corporation 18, 19
Weirton Steel Co. 24
Westinghouse Electric Corporation 33
West Penn Machinery Co. 153
Wheelock, Lovejoy & Co., Inc. 116
Whitehead Stamping Co. 151
Wilkie Die Products Co. 153

Yale & Towne Manufacturing Co., The 103
York Engineering & Construction Co. 113
York-Gillespie Manufacturing Co. 113
Youngstown Sheet & Tube Co., The 17

~ ~ ~

Table of Contents Page 5

Classified Advertising Pages 152, 153

Whether you want one worm-gear speed reducer or a thousand, a standard drive or a unit designed to meet your special problems, Cleveland is prepared to serve you. Meeting the most difficult requirements of machinery manufacturers and users is Cleveland's everyday business.

Just off press...FREE for your asking

YOU'LL find first aid in this new Cleveland catalog — whenever you have to select worm gearing or an efficient worm-gear speed reducer.

Catalog 400 replaces our old Catalog 200. Its 180 pages illustrate and describe each model in the complete line of Cleveland Worm Gear Speed Reducers. It contains engineering data on each type, including dimensions, weights and horsepower capacities—all the information you need to arrive at proper selections of drives for any equipment.

Over a year in the making, Catalog 400 is now available to all our customers. If you can use one in your work of designing power-driven equipment, or selecting speed reducers for new or old machines, just drop us a line on your letterhead.

The Cleveland Worm and Gear Co., 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND

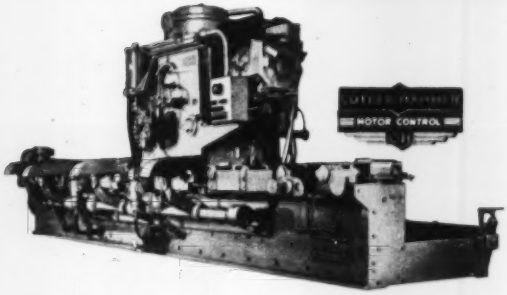
Speed Reducers

CUTLER-HAMMER

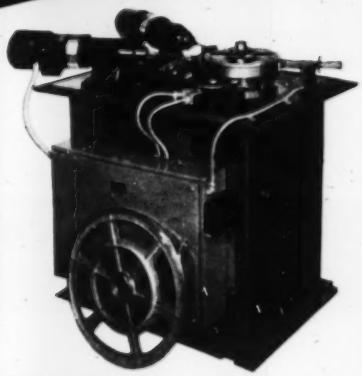
MOTOR CONTROL

C-H

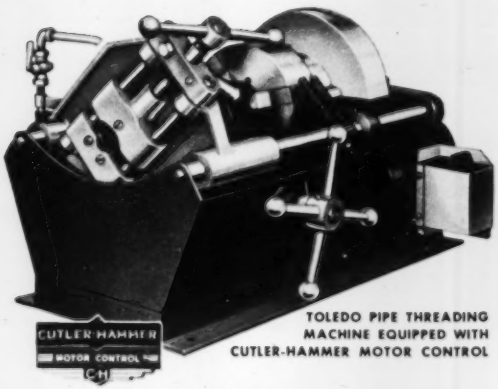
CHOICE OF THE LEADERS — THE MARK OF BETTER MACHINES



THE BONNOT COMPANY BILLETEER. 100% CUTLER-HAMMER MOTOR CONTROL EQUIPPED



GOVRO-NELSON CO. DRILLING AND TAPPING MACHINE. COMPLETELY EQUIPPED WITH CUTLER-HAMMER CONTROL.



TOLEDO PIPE THREADING MACHINE EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL

CROWN CORK & SEAL CO. —CEM BOTTLING SYSTEM EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL

Highest Award for Merit

Leadership is never gained by standing still. The companies that have won widest approval of the market for their products gain such recognition by a policy of ceaseless product improvement and jealous concern for every detail that influences product performance. Such consistent and widespread approval is the highest award for merit the market can bestow and is accorded products that demonstrate their superiority under direct competitive comparison. This coveted seal of approval has long been awarded Cutler-Hammer Motor Control by the nation's leading machinery manufacturers who so frequently and continuously make Cutler-Hammer Motor Control their outstanding choice. You too will find it pays to specify these products of the nation's pioneering motor control manufacturer. CUTLER-HAMMER, Inc., 1211 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ont.